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Research Triangle Park NC 27711

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Metallic Mineral Processing Plants - Background Information for Promulgated Standards

Final EIS

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Metallic Mineral Processing Plants - Background Information for Promulgated Standards

Emission Standards and Engineering Division

U.S ENVIRONMENTAL PROTECTION AGENCY
Office of Air, Noise, and Radiation
Office of Air Quality Planning and Standards
Research Triangle Park, North Carolina 27711

January 1984

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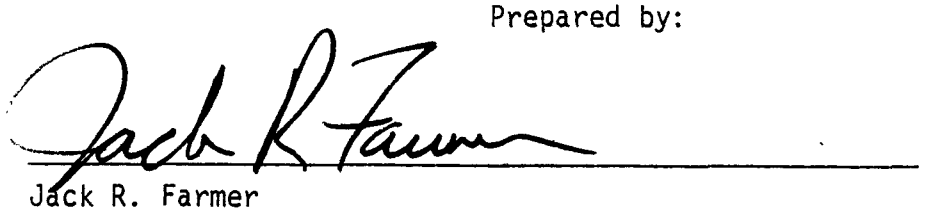
ENVIRONMENTAL PROTECTION AGENCY

Background Information and
Final Environmental Impact Statement for
Metallic Mineral Processing Plants

Prepared by:



2/9/84
(Date)

Jack R. Farmer
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1. The promulgated standards of performance will limit emissions of particulate matter from new, modified, and reconstructed metallic mineral processing plants. Section 111 of the Clean Air Act (42 U.S.C. 7411), as amended, directs the Administrator to establish standards of performance for any category of new stationary source of air pollution that ". . . causes or contributes significantly to air pollution which may reasonably be anticipated to endanger public health or welfare." The promulgated standards of performance are expected to affect mostly the western states.

2. Copies of this document have been sent to the following Federal Departments: Office of Management and Budget, Labor, Health and Human Services, Defense, Transportation, Agriculture, Commerce, Interior, and Energy; the National Science Foundation; the Council on Environmental Quality; State and Territorial Air Pollution Program Administrators; the Association of Local Air Pollution Control Officials; EPA Regional Administrators; and other interested parties.

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1. SUMMARY

On August 24, 1982, the U.S. Environmental Protection Agency (EPA) proposed new source performance standards (NSPS) for metallic mineral processing plants under the authority of Section 111 of the Clean Air Act. The proposed standards were published in the Federal Register (47 FR 36859) with a request for public comment. A public hearing was held on October 7, 1982. No comments were presented at the public hearing. A total of 19 comments from industry, two trade associations, the Oregon State Department of Environmental Quality, and a private citizen were submitted during the comment period. Their comments and EPA's responses are summarized in this document. The summary of comments and responses serves as the basis for the revisions that have been made to the proposed standards.

1.1 SUMMARY OF CHANGES SINCE PROPOSAL

In response to the public comments and as a result of EPA reevaluation, certain changes have been made in the proposed standards. Section 60.380 has been modified to clarify that at open-pit mines only crushers and screens are affected facilities. Within the same section, an explicit exemption from the standards has been added for conveyor belt transfer points between crushers located in an open-pit mine and the concentrator, mill, storage areas, or waste rock disposal areas. The definition of a crusher in Section 60.381 has been modified to indicate that the crusher includes the pan feeder, apron feeder or other conveyors located below the crushing surfaces. This clarification is necessary (1) to distinguish between transfer points between in-pit crushers and subsequent milling operations, which are exempt, and crusher feeders, which are part of an affected facility, and (2) to indicate that emissions from material dropped from the crushing surfaces onto these feeders are intended to be

controlled. Emissions from these feeders would be indistinguishable from crushers and would be controlled simultaneously with the crusher emissions.

The definition of "metallic mineral processing plant" has been modified and a definition of "metallic mineral concentrate" has been added in order to clarify what is meant by a metallic mineral processing plant.

The list of ore-contact surfaces whose repairs are exempt from reconstruction provisions (Section 60.15) has been expanded to include surfaces on pan feeders. Pan feeders are located in high impact areas and can be subject to a repair frequency similar to that of other ore contact surfaces. A discussion of the rationale for exempting repairs to ore contact surfaces is provided in the preamble to the proposed standards (47 FR 36867).

Section 60.384 is expanded to clarify that the owner or operator of a wet scrubber is required to record the scrubber liquid flow rate to the scrubber and the change in pressure of the gas stream across the scrubber during the initial performance test and at least weekly thereafter. Reporting of the results of the initial performance tests including these readings is required by the General Provisions. However, semiannual reporting of subsequent readings is only required when one or more weekly readings of the pressure difference or liquid flow rate differs by more than ±30 percent from the readings of the most recent performance test.

Section 60.385 (Test methods and procedures), is expanded to indicate that Method 9, Visual Determination of the Opacity of Emissions from Stationary Source (Appendix A, 40 CFR Part 60), is to be used for determining opacity for stack and process fugitive emissions. This section now directs the person observing opacity to take readings only when emissions are clearly identified as emanating solely from the affected facility being observed.

Method 9 has been amended to provide additional instructions for determining opacity from fugitive sources.

1.2 SUMMARY OF THE IMPACTS OF THE PROMULGATED ACTION

1.2.1 Alternatives to the Promulgated Action

The alternative control techniques are discussed in Chapter 6 of "Metallic Mineral Processing – Background Information for Proposed Standards," EPA-450/3-81-009b, August 1982. (This document is also referred to as the Background Information Document [BID].) These regulatory alternatives reflect the different levels of emission control from which one is selected that represents the best demonstrated technology, considering costs, nonair quality health and environmental and economic impacts for metallic mineral processing plants. These alternatives remain the same.

1.2.2 Environmental Impacts of the Promulgated Action

The environmental impacts of the proposed standard are discussed in Chapter 7 of the BID. A review of these environmental impacts indicated no changes were necessary, and therefore, the impacts remain unchanged since proposal. However, it should be noted that because metallic mineral processing plants will operate under a variety of processing conditions, the impacts of the proposed standard were analyzed in terms of worst-case conditions that might be expected anywhere in the industry. These worst-case conditions were then assumed for all affected facilities in the industry. The result of these assumptions has been to overestimate somewhat the environmental impacts, which is consistent with the overestimate of control costs to ensure compliance under worst-case conditions.

The review of the environmental impacts discussed in the proposal BID constitutes the final Environmental Impact Statement.

1.2.3 Economic and Energy Impacts of the Promulgated Action

The economic impacts of the proposed standard are discussed in Chapter 9 of the BID. A review of these economic impacts indicated no changes were necessary, and therefore, the impacts remain unchanged since proposal. As discussed in the previous section, the impacts of the proposed standard were analyzed in terms of worst-case conditions. These worst-case conditions were then assumed for all affected facilities in the industry. Economic impacts were then calculated on the worst-case

assumption that all facilities would require high-energy wet scrubbers to meet the standards. The result of these assumptions has been to overestimate the economic impacts.

The energy impacts of the proposed standards are discussed in Chapter 7 of the BID and remain unchanged for the promulgated standards.

1.2.4 Other Considerations

1.2.4.1 Irreversible and Irretrievable Commitment of Resources. This impact is discussed in Chapter 7 of the BID and remains unchanged since proposal.

1.2.4.2 Environmental and Energy Impact of Delayed Standards. This impact is discussed in Chapter 7 of the BID and remains unchanged since proposal.

2. SUMMARY OF PUBLIC COMMENTS

A list of commenters, their affiliations, and the EPA docket entry number assigned to each comment are shown in Table 2-1. Twenty letters commenting on the proposed standard and the Background Information Document for the proposed standard were received. Significant comments have been combined into the following seven categories:

2.1 General

2.2 Emission Control Technology

2.3 Modification and Reconstruction

2.4 Economic Impact

2.5 Environmental Impact

2.6 Energy Impact

2.7 Test Methods and Monitoring.

Comments, issues, and their responses are discussed in the following sections of this chapter. Changes to the regulations are summarized in Subsection 1.2 of Chapter 1.

2.1 GENERAL

2.1.1 Comment: (IV-D-1) One commenter objected to the EPA's proposal of emission limits based on the performance of control equipment under so-called "worst-case" conditions. He also felt that the EPA had not established the standard at stringent enough levels to ensure that the control device is operated and maintained as well as possible. This commenter proposed that the EPA require that all new sources be controlled at least as well as the average existing source employing "best technological systems." Based on EPA test data, this commenter stated that the stack particulate mass concentration emission limit should remain at 0.05 g/dscm; but the stack emission opacity standard should be reduced from 7 percent to zero percent opacity; and the process fugitive standard should be reduced from 10 percent to 5 percent opacity.

Response: In setting emission limits for a particular process or group of processes under Section 111 of the Clean Air Act (CAA), the EPA must consider the range of operating conditions that would affect emissions from these processes [National Lime Association v. EPA, 627 F.2d 416 (1980)]. Therefore, the EPA analyzed and tested numerous well-designed and well-maintained facilities in the metallic mineral industry to determine the most difficult control conditions and the emission limits that could be achieved in these circumstances. In selecting control devices for testing, the Agency consciously chose those devices that were well-maintained and operated in accord with the General Provisions [FR 60.11(d)] that require that owners and operators "maintain and operate any affected facility including the associated air pollution control equipment in a manner consistent with good air pollution control practice for minimizing emissions." To base emission limits on the average performance of a large sample of well-maintained control devices as suggested by the commenter would likely render noncompliant those control devices that operate under conditions more difficult than the average. Therefore, the stack emission opacity standard and the process fugitive emission standard will not be revised.

2.1.2 Comment: (IV-D-11, IV-D-18) Two commenters contended that mass emission limits were based on the performance of high-energy wet scrubbers that had not been "adequately demonstrated" as mandated in the Clean Air Act. These commenters stated that high-energy wet scrubbers were not currently in use at metallic mineral plants and therefore not available for testing and that the Agency relied instead on the modeling of scrubber performance to predict their operating characteristics. One of these commenters (IV-D-11) also indicated her understanding that baghouses were also not adequately demonstrated. Both commenters recommended that the mass emission limit for these standards be revised and that a new standard be based on the performance of low-energy wet scrubbers or other "adequately demonstrated" technology.

Response: The EPA must demonstrate that a standard is achievable over the range of conditions normally found in the industry, and therefore, the performance of control options is analyzed in terms of worst-case conditions. The basis for selecting worst-case conditions is discussed below. Since high-energy wet scrubbers are not currently in use, the

EPA used modeling to predict the performance of these scrubbers under worst-case operating conditions. Primary evidence for the achievability of the standard is derived from the EPA's test program of operating control devices, including both baghouses and wet scrubbers.

The EPA tested a variety of control devices including baghouses and wet scrubbers, primarily low pressure drop scrubbers, operating under a variety of conditions. All baghouses and all but two of the wet scrubbers tested in the mineral processing industry were able to meet the proposed mass emission standard. Both of the scrubbers that exceeded the proposed mass emission level were operating with relatively low pressure drops (6 inches and 10 inches of water) and high mass loadings. The modeling of scrubber performance using a predictive mathematical system indicated that in both cases a 15-inch pressure drop scrubber could reduce emissions from these sources to the proposed mass emission limits. The predictive capability of this model has been widely demonstrated as discussed in the document entitled Venturi Scrubber Performance Model (EPA-600/2-77-172). In situations where there are no existing facilities controlled with the best available control system, it is technically feasible and legally permissible to use modeling techniques to project the system's performance. The United States Court of Appeals for the District of Columbia Circuit has specifically upheld the use of reasonable projections based on the application of existing technology in other industrial settings when the recommended technology is not currently in use at existing plants in the industry being regulated under Section 111 [Portland Cement Association v. Ruckelshaus, 486 F.2d 375 (1973)].

The EPA went one step further to demonstrate that the full range of operating conditions possible in the industry were considered. A hypothetical situation involving conditions of high uncontrolled emissions, small particle size, and high moisture was developed. A baghouse that had been tested under identical mass loading and particle size conditions but with low moisture conditions, was able to meet the proposed standard. However, high moisture conditions in the metallic minerals industry and problems of moisture condensation affect the use of baghouses and may require the use of wet scrubbers. Because these worst-case conditions could not be exactly duplicated at currently operating facilities, it was again necessary to simulate performance of a wet scrubber under such

conditions using a mathematical model. This model demonstrated that a 30-inch pressure-drop wet scrubber, which is currently available for installation at new plants, could reduce emissions under these hypothetical worst-case conditions to the level of the mass emission standard. Such worst-case conditions of high uncontrolled emissions, small particle size, and high moisture appear as a very low probability occurrence because high moisture conditions would lower uncontrolled emissions. Nonetheless, the EPA considered these conditions in order to ensure that the mass emission standards were demonstrated as achievable under the full range of operating conditions.

Considering the range of tests of wet scrubbers under actual operating conditions and the modeling of wet scrubber performance under hypothetical worst-case conditions, the EPA believes it has adequately demonstrated the achievability of the mass emission standard proposed for the metallic mineral processing industry based on the use of wet scrubbers. The EPA has also shown that baghouses are also capable of meeting the standards under most operating conditions found in the industry, although not necessarily under worst-case conditions.

2.1.3 Comment: (IV-D-2) One commenter indicated that the format of the stack emission standard that requires continuous control of emissions to a level of 0.05 grams per dry cubic meter deviates from the "Agency's well-established practice of regulating averaged mass flows." The commenter stated that the current form of the mass standard would cause inequities in the industry such as allowing a facility that operates 8 hours per day only one-third the emissions of a facility operating 24 hours per day.

Response: Congress mandated in Section 111(a) of the Clean Air Act that the Agency develop standards of performance for new stationary sources that reflect "the degree of emission reduction achievable through the application of the best system of continuous emission reduction considering costs, non-air quality health and environmental impacts, and energy requirements." In fulfilling the congressional intent, the actual emission limitations formulated by the EPA can take one of several forms. As discussed in the preamble to the proposed standard, often the most equitable standards relate the allowable emissions to the amount of material processed (i.e., pounds of emissions per pounds of material

processed). As discussed in the proposal preamble (see Selection of Format for the Proposed Standards), this type of format was not possible for many types of facilities in this industry. Therefore, a concentration format was chosen. For normal industry practice, however, a concentration standard should generally relate the emissions to material processed. For example, a small crusher would require a smaller control device with a correspondingly lower air flow rate than a large crusher. Thus the mass of controlled emissions emitted from the small crusher should be less per unit of full-capacity operating time than that from the large crusher. However, the actual emissions per ton of material processed should be similar whether a company elects to have one large crusher process a specified amount in an 8-hour day; or a smaller crusher process the same amount in 24 hours.

The argument might be made that a company could circumvent this standard either by placing an oversized, high-flow rate control device on a facility or by running a facility significantly under capacity. However, the capital, operating, and maintenance costs of such an approach would very likely preclude extensive use of this strategy. More importantly, such a circumvention of the standard would be a violation of the General Provisions (40 CFR 60.12). Therefore, in the Administrator's judgement, the concentration standard format is equitable and within the intent of the Clean Air Act.

2.1.4 Comment: (IV-D-8, IV-D-9, IV-D-10, IV-D-18) Several commenters expressed concern about potential problems and inconsistencies in the definition of "metallic mineral processing plants" presented in the proposal preamble and regulation. They believe that the definition as presented in the regulation might be interpreted to include primary aluminum reduction plants under these standards, even though a separate standard has been developed for reduction plants. They also believe that the use of the term "aluminum plant" instead of the term "alumina plant" in the preamble may also cause confusion. Two commenters also suggested that the definition of metallic mineral plants be clarified to indicate what portions of integrated ore process/smelting operations are covered by the standards.

Response: As a result of these comments, the definition of "metallic mineral processing plants" has been revised. The standard is intended

to cover the production of alumina (aluminum oxide) from bauxite but not the subsequent reduction of alumina to aluminum; therefore, the definition has been modified to delineate the beginning and end of metallic mineral processing. For the purpose of these standards, metallic mineral processing includes all operations up to and including the final loading of concentrates for shipment to off-site refining and smelting operations. Where the concentration and refining operations are located at one site, as in an integrated facility, metallic mineral processing includes all storage and transfer operations up to the refining operations that produce purified metals from concentrates.

For further clarification, a separate definition of "metallic mineral concentrate" has also been added. This definition clarifies the fact that concentrates are usually intermediate products between the mining of ore and the production of refined metals. Metallic mineral concentrates require additional processing to produce refined metals although this additional refining to pure metals is not always performed. For example, alumina may be used as a refractory and in other chemical production processes or titanium dioxide can be used in the production of paint. Although these concentrates are not refined to pure metals, their production is still covered by the standard.

2.1.5 Comment: (IV-D-12, IV-D-18) Two commenters noted that the preamble indicates that the loading and hauling of ore in the mine is exempted from the standards but that truck loading and railcar loading stations are listed as affected facilities in the regulation. These commenters recommended that changes in the regulation be made to eliminate inconsistencies and to indicate that loading of ore in the mine is not covered by the standards.

Response: The EPA exempted the loading of material onto trucks and railcars by mobile equipment such as front-end loaders or shovels at the mine site because of the limited demonstration of the effectiveness of specific control techniques for these sources for the variety of conditions experienced across the country. Section 60.380 now specifically states that only crushers and screens are considered to be affected facilities in open-pit mines.

2.1.6 Comment: (IV-D-10, IV-D-18) Two commenters noted that the preamble to the proposed regulation discussed several types of facilities

or operations that are located within the bounds of a metallic mineral plant but are not covered by the proposed standards. These commenters requested that the EPA explicitly list in the regulation those facilities not covered by the standards.

Response: In the preamble to the proposed regulations (47 FR 36861), the EPA discussed the rationale for exempting from the proposed standards certain major operations or facilities at metallic mineral processing plants. This discussion is intended to provide for the public the background information and support for the decisions on the coverage or non-coverage of major facilities at metallic mineral processing plants.

In the regulation (40 CFR 60.380), the Agency provides a legal designation of those metallic mineral processing facilities that are "affected" by the regulation. The Agency also provides a specific definition of the circumstances under which a facility listed as "affected" would not be covered by the regulations (e.g., when they are located in underground mines). The EPA does not provide a list of "non-affected" facilities in the regulation because question would arise as to the legal standing of metallic mineral facilities or operations that were not specifically listed as either "affected" or "non-affected."

2.1.7 Comment: (IV-D-2, IV-D-18) Two commenters felt that the stack opacity standard was redundant with the stack mass emission standard and could be eliminated.

Response: Opacity limits are used in conjunction with mass emission limits to ensure proper operation and maintenance of control equipment, to lower compliance costs, and to simplify enforcement procedures. Effective enforcement includes initial demonstration of compliance and routine evaluation of control equipment operation and maintenance. Compliance with particulate mass emission limits can only be demonstrated with EPA Method 5 performance tests. However, Method 5 tests may be too expensive and time consuming to be used routinely to monitor for the proper operation and maintenance of emission control equipment, which is the key factor in continuous compliance with the emission limit. In contrast, EPA Method 9 opacity tests are quicker, simpler, and less expensive than EPA Method 5. Therefore, opacity limits have been adopted in the standards as an effective tool to assure proper operation and maintenance of control equipment (Clean Air Act, Section 302(k)). The

opacity limits have been set at levels no more restrictive than the particulate mass emission limits to ensure that any observed violations of the opacity standards accurately indicate a violation of the particulate mass emission limits. In addition, the United States Court of Appeals for the District of Columbia Circuit has specifically upheld the use of opacity standards as a means of assuring control of mass emissions under NSPS in Portland Cement Association v. Train, 513 F.2d 506, 508 (1975).

2.1.8 Comment: (IV-D-2, IV-D-18, IV-D-19) A number of commenters objected to a process fugitive standard. One of these commenters (IV-D-19) felt that it had not been justified in terms of its air quality benefits. Two other commenters (IV-D-2 and IV-D-18) stated that the lack of difference between a 10 percent process fugitive emission standard and a 7 percent stack standard seemed to imply that EPA was requiring uncontrolled emissions to be as low as controlled emissions from a stack. One commenter (IV-D-19) noted that EPA data showed that all facilities tested were meeting the process fugitive standard and that there is no reason to expect that practices would change. This commenter felt that the additional monitoring, performance tests, and recordkeeping resulting from the standard were not justified in view of the insignificance of the emissions. Therefore, he felt the standard can be eliminated. On the other hand, one commenter (IV-D-18) stated that the standard should be raised from 10 to 20 percent opacity.

Response: The process fugitive emission standard serves at least two purposes. First the standard ensures that emissions from facilities that use control devices such as wet scrubbers or baghouses are in fact collecting these emissions at the point of generation and ducting them to the control device. Demonstrations of control device efficiency in meeting the stack emission standard would do little good if emissions were not being properly ducted to the device. Thus, where control devices are used, the process fugitive emission standard is designed to prevent short-circuiting of emissions and to ensure that the air quality benefits that accrue to the control of stack emissions are achieved.

Second, the process fugitive emission standard allows the facility to use alternative methods of emission control. For example, if the operator of a facility can keep the process fugitive emissions below

10 percent by using enclosures and/or wet suppression, then the operator would not be required to duct emissions to a control device such as a wet scrubber.

As noted by one commenter (IV-D-19) the EPA test data do indeed demonstrate the achievability of the standard. Although the EPA's experience shows that a poorly designed capture system could cause emissions in excess of the standard, EPA test data show that properly designed systems can meet the fugitive opacity standard of 10 percent. In addition, as discussed above, eliminating the standard would make it impossible to judge the effectiveness of alternative control systems such as wet suppression.

While recordkeeping and reporting for initial performance testing and periodic readings for the fugitive opacity standard are not required by the metallic minerals NSPS, a separate notice requiring recording and reporting of Method 9 opacity readings is being drafted for inclusion in the General Provisions to 40 CFR Part 60. The ongoing costs of monitoring and demonstrating compliance with the fugitive opacity standard increase only marginally the total costs of performance testing and monitoring for the entire metallic minerals NSPS.

For the above reasons, the Administrator has determined that the process fugitive emission standard is necessary and justified.

2.1.9 Comment: (IV-D-2, IV-D-18) Two commenters felt that the 7 percent stack opacity standard was unduly restrictive and that an opacity standard of 20 percent (more commonly allowed by the States) should be set.

Response: Test data from 25 baghouses, 21 of which showed a maximum of 0 percent opacity, demonstrates the achievability of the stack opacity standard. The standard was set above the level of the highest 6-minute average observed at a baghouse tested by the EPA. Therefore, the test data indicate that the 7 percent stack opacity is appropriate.

2.1.10 Comment: (IV-D-2, IV-D-7, IV-D-15) One commenter questioned the necessity for additional regulations for the metallic mineral processing industry. The commenter felt that current regulatory standards adequately protect the quality of the Nation's air, both in and around metallic mineral processing plants. Another commenter stated that the regulation was unnecessary because emissions from metallic mineral processing are not suspended particles that adversely affect air quality

but instead are coarse matter that falls to the ground within a short distance of the source and, therefore, provide no hazard to health or degradation of the environment. The commenter further stated that emissions from new plants are controlled by Prevention of Significant Deterioration (PSD), New Source Review (NSR), and Best Available Control Technology (BACT) regulations, as well as State and local requirements and asked the EPA to drop the NSPS due to insignificant benefits and burdens. The third commenter suggested that the NSPS be delayed until a new national ambient air quality standard (NAAQS) based on particle size is established.

Response: The National Ambient Air Quality Standard for particulate matter is 150 micrograms per cubic meter ($\mu g/m^3$) calculated as a 24-hour average concentration. The NAAQS allows this concentration to be exceeded once per year. Although some fraction of the material emitted from metallic mineral plants could be expected to fall out within the plant boundary, dispersion modeling projections indicate that sufficient material could be transported beyond the plant boundary to cause violations of the NAAQS if no contols are applied. Dispersion modeling of metallic minerals emissions allowed under current standards indicates that the maximum 24-hour average concentration in the vicinity of processing plants could range from 153 $\mu g/m^3$ for small uranium plants to 1,007 $\mu g/m^3$ for a large iron ore plant. These concentrations were all reduced to below the NAAQS when emission levels were reduced to those allowed by the NSPS.

Standards of performance are promulgated under Section 111 of the Clean Air Act. Section 111(b)(1)(A) requires that the Administrator establish standards of performance for categories of new, modified, or reconstructed stationary sources that in the Administrator's judgment cause or contribute significantly to air pollution that may reasonably be anticipated to endanger public health or welfare. Standards of performance prevent new air pollution problems from developing by requiring application of the best technological system of continuous emission reduction that the Administrator determines to be adequately demonstrated. The 1977 Amendments to the Clean Air Act added the words, "in the Administrator's judgment," and the words, "may reasonably be anticipated," to the statutory test. The legislative history for these changes stresses two points:

- The Act is preventive, and regulatory action should be taken to prevent harm before it occurs; and
- The Administrator should consider the contribution of each single class of sources to the cumulative impact of all particulate matter emitters.

The 1977 Amendments to the Clean Air Act also required that the Administrator promulgate a priority list of source categories for which standards of performance are to be promulgated. The priority list, 40 CFR 60.16, was promulgated in the Federal Register August 21, 1979 (44 FR 49225). Development of the priority list was initiated by compiling data on a large number of source categories from literature sources. Major stationary source categories were then subjected to a priority ranking procedure using the three criteria specified in Section 111(f) of the Act. The procedure ranks source categories on a pollutant-by-pollutant basis. In this ranking, first priority was given to the quantity of emissions, second priority was given to the potential impact on health or welfare, and third priority was given to the mobility and competitive nature of the source category.

In light of the considerations stated above, the Administrator found that the metallic mineral processing industry is a "significant contributor." (Applying the criteria for prioritizing such contributors, the Administrator ranked the metallic mineral processing industry 14th of 59 source categories on the priority list.) This listing decision requires the Agency to promulgate standards of performance for new sources in this category.

Standards of performance required by Section 111 play a unique role under the Clean Air Act. The main purpose of standards of performance is to require new sources, wherever located, to reduce emissions to the level achievable by the best technological system of continuous emission reduction considering the cost of achieving such emission reduction, any nonair quality health and environmental impact, and energy requirements [(Section 111(a)(1)]. Congress recognized that establishing such standards would minimize increases in air pollution from new sources, thereby improving air quality as the nation's industrial base is replaced over the long-term. An NSPS thereby serves as a distinct means of achieving the Act's goals, supplementing the role played by the Reasonably Available

Control Technology (RACT) requirements for existing and new sources within state implementation plans developed for the purpose of attaining the NAAQS.

Where RACT-level control is already in place, however, the impact of NSPS will be smaller than calculated. RACT and the systems chosen as the best demonstrated technology for this industry's standards of performance for new stationary sources are not conflicting types of control; therefore, where RACT already applies, the standards of performance will supplement RACT-level control. The EPA has determined that existing RACT-level facilities that become subject to the standards of performance (e.g., through modification) can achieve the additional reduction required at a reasonable cost.

Congress also intended NSPS to play an integral role in the new source review programs of the Act. Standards of performance required by Section 111 also serve as the minimum level of emission control for BACT and Lowest Achievable Emission Reduction (LAER), which are determined case-by-case. Promulgation of these standards therefore assures that BACT and LAER for individual sources are not less stringent than the "best demonstrated technology" for the class of sources into which those individual sources fall. Absent identification of "best demonstrated technology" through promulgation of NSPS's, BACT and LAER might be less stringent than BDT-level control.

Also, the standard has other benefits in addition to reducing emissions beyond those levels required by current State regulations. Standards of performance establish a degree of national uniformity, which precludes situations in which some States may attract industries by relaxing air pollution standards relative to other States. They improve the efficiency of case-by-case determinations of BACT for facilities located in attainment areas and LAER for facilities located in nonattainment areas, by providing documentation and a starting point for the basis of these determinations. This documentation results from the process of developing a standard of performance, which involves identification and comprehensive analysis of alternative emission control technologies, development of associated costs, evaluation and verification of applicable emission test methods, and identification of specific emission limits achievable with alternate technologies.

The existence of other environmental regulations was considered during selection of BDT, but their existence does not lead the EPA to conclude that standards reflecting better control technology cannot be applied at reasonable costs.

The EPA is evaluating a possible change in the NAAQS for particulate matter based on particle size considerations. However, the Clean Air Act requires the timely promulgation of NSPS for priority industries and does not allow for a delay in the promulgation of this NSPS. The impacts of any changes in the particulate matter NAAQS on this NSPS and previously promulgated NSPS for other industries will be handled in a similar fashion. Until such changes are made to the NAAQS, this NSPS will be based on the same assumption that guided the previous promulgation of NSPS's for other particulate matter sources, namely that all suspended particulate matter impacts human health and the environment.

2.1.11 Comment: (IV-D-7) One commenter noted, after listing all the affected facilities covered by the proposed NSPS, that the standards regulate every constituent of a new or modified metallic mineral processing plant and, as such, are unnecessarily burdensome.

Response: In accordance with its congressional mandate to set performance standards based on best systems of continuous emission reduction considering cost, the EPA reviewed all operations associated with the mining and processing of metallic minerals for possible coverage by the NSPS. Certain of these operations and facilities are not covered by the proposed standards for reasons of unavailability of adequately demonstrated control systems or other technical complications. Those facilities now listed as affected and covered by the proposed NSPS represent those for which the EPA has adequately demonstrated control techniques, which can be applied at reasonable cost.

As discussed in the proposal preamble, the choice of the affected facility is based on the Agency's interpretation of Section 111 of the Act and judicial construction of its meaning. (The most important case is ASARCO, Inc. v. EPA, 578 F.2d 319 (D.C. Cir. 1978).) Under Section 111, the NSPS must apply to "new sources;" "source" is defined as any building, structure, facility, or installation which emits or may emit any air pollutant" [Section 111(a)(3)]. Most industrial plants, however, consist of numerous pieces or groups of equipment that emit air pollutants and

that might be viewed as "sources." The EPA therefore uses the term "affected facility" to designate the equipment, within a particular kind of plant, which is chosen as the "source" covered by a given standard.

In choosing the affected facility, the Administrator must decide which pieces or groups of equipment are the appropriate units for separate emission standards in the particular industry. The Administrator must do this by examining the situation in light of the terms and purpose of Section 111. One major consideration in this examination is that the use of a narrower definition results in bringing replacement equipment under the standards sooner. If, for example, an entire plant is designated as the affected facility and a piece of equipment is replaced, no part of the plant would be covered by the standards unless the replacement causes the plant as a whole to be "modified" or "reconstructed." The plant as a whole could be considered modified only if the replacement resulted in an increase in the aggregate emissions from the entire plant. The plant as a whole could be considered reconstructed only if the cost of the replacement exceeded 50 percent of the cost of an entire new plant. If, on the other hand, each piece of equipment is designated as the affected facility, then, as each piece is replaced, the replacement piece will be a new source subject to the standards regardless of the cost of the replacement or whether the replacement caused emissions from the plant as a whole to increase. Since the purpose of Section 111 is to minimize emissions by application of the best demonstrated control technology (considering cost, health and environmental effects, and energy requirements) at all new, modified, and reconstructed sources, there is a presumption that a narrower designation of the affected facility is proper. This presumption ensures that new emission sources within the plant will be brought under the coverage of the standards as they are installed; however, this presumption can be overcome if the Agency concludes either that (1) a broader designation of the affected facility would result in greater emissions reduction than would a narrow designation or (2) other relevant statutory factors (technical feasibility, cost, energy, and other environmental impacts) point to a broader designation.

2.1.12 Comment: (IV-D-6) One commenter requested that an exemption from the proposed standards be granted for very small (2 or 3 man)

operations that might otherwise be forced out of business by the regulations.

Response: Further questioning of the commenter revealed no examples of processing plants of the size mentioned, and none are known to exist (docket item IV-E-3). Therefore, the EPA can find no basis for establishing such an exemption at this time.

2.1.13 Comment: (IV-D-19) One commenter requested that small pieces of equipment be exempted from the stack mass emission standards because of their relatively minor air quality impacts. Such an exemption could be phrased in terms of air flow rate through the control device or process throughput rate. The EPA requested more evidence from this commenter that would indicate that an exemption was warranted on technical or economic grounds (docket item IV-E-5). The commenter indicated that he felt that an air flow rate of 1000 to 2000 cubic feet per minute would be an appropriate cutoff because of the insignificance of emissions from such devices. The commenter also indicated his understanding that it was common practice for the EPA to set size criteria within a specific industry below which an NSPS would not apply.

Response: In developing standards of performance the EPA is mandated under Section 111 of the Clean Air Act to develop standards that reflect the degree of emission limitation achievable through application of the best technological systems of continuous emission (taking into consideration cost, nonair health and environmental impacts, and energy requirements). Where appropriate, the EPA has promulgated separate requirements for certain subcategories of industrial source categories. These subcategories may be defined by various criteria including size of operation and type of material processed. Typically, this need for special consideration arises from one of several causes. For example, there may be economies of scale apparent within an industry that would cause a standard applied across the industry to have disproportionately adverse economic impacts on small facilities. Also, there may be reasons of technical feasbility that would result in certain segments of an industry being regulated differently or exempted from coverage. Such decisions are made for specific reasons on a case-by-case basis.

In analyzing the technical and economic impacts of the proposed standard for the metallic mineral industry, the EPA could find no reasons

to exempt affected facilities below a certain size limit. Since the commenter indicates that the process equipment would already have a control device affixed to it, technical feasibility is not an issue. Likewise the major cost of meeting the standard is the application of a control device. Based on the EPA's analysis of both large and small model plants of various configurations, this cost of control equipment is reasonable. The incremental cost of an initial performance test and the minimal recordkeeping required by these standards will not have a significant economic impact on these operations. Thus, the EPA has proposed that these standards cover all affected facilities regardless of size.

2.1.14 Comment: (IV-D-10) One commenter recommended that experimental testing of equipment not be covered by the NSPS. Further questioning of the commenter indicated that he was concerned about the application of the NSPS during the initial startup phases of an operation (docket item IV-B-6).

Response: The General Provisions (40 CFR 60.8) provide that: "Within 60 days after achieving the maximum production rate at which the affected facility will be operated, but not later than 180 days after initial startup of such facility..., the owner or operator of such facility shall conduct performance test(s) and furnish the Administrator a written report of the results of such performance test(s)." Experimental testing or "debugging" of new equipment of the type referred to by this commenter could be performed within this timeframe.

2.2 EMISSION CONTROL TECHNOLOGY

2.2.1 Comment: (IV-D-18) One commenter interpreted the EPA's discussion of high pressure drop wet scrubbers as a recommendation that this device be considered the preferred control method for the industry. This commenter was also concerned that such a recommendation would require a new facility in areas subject to Prevention of Significant Deterioration Provisions to install high-energy scrubbers as the Best Available Control Technology.

Response: The EPA does not necessarily recommend the use of a high pressure drop scrubber or any other emission control technology to attain and maintain compliance with the performance requirements of this standard. Compliance with the pollutant concentration limits of this

standard can generally be achieved by application of one of many alternative emission control strategies, and, for a specific case, the EPA does not require that a particular control device be used.

The determination of Best Available Control Technology for sources subject to Prevention of Significant Deterioration provisions results from a case-by-case analysis considering economic, energy, and environmental factors. As defined in 40 CFR 52.21(b)(12) "Best available control technology means an emissions limitation (including a visible emission standard) based on the maximum degree of reduction for each pollutant subject to regulation under the Act....which the Administrator, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other cost, determines is achievable..."(emphasis added). Embodied in this definition is the emissions limitation criteria for the determination of BACT. Site-specific factors, while considered in establishing BACT, are not considered in the NSPS process, and, therefore, the PSD review authority has some degree of flexibility in determining BACT. In no case can the BACT emission limitation be any less stringent than an applicable NSPS. Once the numerical value is established any control technology can be used by the plant to achieve the emission limit provided no other adverse environmental impacts result from its use. However, in actual practice, the PSD reviewing authority must exercise judgment in approving the use of a particular control device to ensure that the device is appropriate, is sufficiently reliable, and will not adversely affect other environmental factors for the particular case.

As the analysis of the high-energy scrubber shows, there are extreme case-specific factors that may require use of that technology to comply with the NSPS. Furthermore, there may be other cases where a BACT emission limitation more stringent than the NSPS emission limit may require use of medium- or high-energy rather than low-energy scrubbers. However, the PSD review authority must weigh the statutorily prescribed factors in each case and arrive at the appropriate level of BACT.

2.2.2 Comment: (IV-D-11, IV-D-14) Two commenters discussed numerous problems with the use of baghouses at metallic mineral plants. Commenters noted that baghouses are subject to bag breakage, which requires maintenance that exposes repair workers to high concentrations of dust.

Breakage problems could also require the installation of dual baghouse systems, the cost of which was not considered in the economic analyses. The fire danger associated with maintenance welding around baghouses will be higher than with wet scrubbers. Finally, the handling and disposal of dust collected in baghouses can be a problem.

Response: The Agency's experience and a review of numerous industry applications of baghouses at mineral processing facilities indicate that, although the problems enumerated above can occasionally occur with the use of baghouses, good maintenance practices with properly designed baghouses will minimize their occurrence. The selection of the proper baghouse fabric, air-to-cloth ratios, and baghouse configuration will greatly reduce the frequency of bag breakage. The use of compartmentalized baghouses will allow the isolation of a section of the baghouse for maintenance while the rest of the baghouse is kept on-line. The use of compartmentalized baghouses, whose costs were calculated for the standard, will eliminate the need for dual systems.

Repair workers will require protection from exposure to high concentrations of dust by techniques similar to those used in other high exposure areas of metallic mineral plants. These techniques include the use of respirators, proper ventilation, dust suppression and other methods. Fire danger from welding sparks sucked into baghouses can be eliminated by shutting down the section of the baghouse on which repair is occurring and by other common safety measures.

Discussions with design engineers familiar with the metallic mineral industry indicate that the methods used for disposing of collected dust will vary with the location of the control device and can even influence the selection of the type of control device for a particular facility. If slurried material can be disposed easily, as to a wet beneficiation system, then a wet scrubber may be the preferred control device. On the other hand, where the collected particles are more readily disposed or recycled in a dry state, as when they are comprised primarily of the final concentrates, a baghouse may be preferred. The Agency has also inspected several facilities in which materials collected in baghouses are slurried and recycled to the beneficiation system.

The EPA does not deny the possibility of problems with baghouses or any other types of control devices that are not properly designed for

the control situation or are not properly maintained. Conversely, most problems can be eliminated with proper design, installation, and maintenance. Where these problems cannot be avoided, the standard permits the use of alternative technology such as wet scrubbers.

The selection of a particular type of control device will depend on a variety of factors including overall reliability in a specific situation. The choice ultimately resides with the facility's personnel. As stated in the preamble to the proposed standard, baghouses may be used to achieve compliance with the standards; however, their use is not required.

2.2.3 Comment: (IV-D-13) One commenter calculated that wet scrubbers at a metallic mineral plant can use from 0.5 to 1.5 million gallons of water per day. The cost of treating this water should be recalculated in view of the fact that industry data show that the cost of complete recycle is 100 times higher than the Effluent Guidelines Division cost provided in Chapter 8 of the BID.

Response: The commenter calculated the scrubber water usage of 0.5 to 1.5 million gallons of water per day on the assumption that scrubbers use water once and then dispose of it (docket item IV-E-9). This is not correct. Scrubbers are typically designed to recycle from 95 to 99 percent of their water internally. The slurry that is eventually discharged is suitable for use in the beneficiation circuit of most plants and is often piped to that part of the mill for use as process water. Thus, typical plant-wide water usage increases that result from the use of wet scrubbers are very small -- theoretically only evaporative, pumping, and leakage losses. Even if the scrubber slurries were directly discharged to the tailings treatment system their volume would represent less than 1 percent of the expended process water.

The EPA's Effluent Guidelines Division reports that a relatively unique configuration at one metallic mineral processing plant could cause a great increase in the cost of complete recycle of total plant process water, although this will not normally be the case (docket item IV-B-5). Regardless of the actual cost of treating process effluents, the disposal of wet scrubber slurries should have little impact on the cost of treating process effluents because even under worst-case conditions scrubber slurries would represent less than 1 percent of the process effluents.

2.2.4 Comment: (IV-D-15) One commenter objected to the use of non-metallic industry data in evaluating control equipment performance in metallic mineral industries. She noted that metallic ores are often dissimilar to non-metallic ores, particularly in concentrate and byproduct characteristics. This commenter also stated that, if the EPA used non-metallic data, then the stack mass emission standard should be as high as the stack standard for the coal preparation industry (0.04 gr/dscf).

Response: As discussed in Chapter 4 of the proposal BID and preamble, emissions from metallic mineral processes and non-metallic processes are very similar in terms of the crucial characteristics of mass loading and particle size. Data from non-metallic plants were used in order to further our understanding of the performance of control devices under possible worst-case conditions. In addition to the fact that emissions from metallic and non-metallic ores are similar, it should also be noted that metallic ores are often comprised primarily of non-metallic minerals.

The material processed in the coal preparation industry and the emissions from thermal dryers at the coal preparation plants differ in several critical variables from the material and emissions at metallic mineral plants. Emissions from coal preparation dryers are characterized by high uncontrolled emission concentration (8-10 grains per standard cubic foot and higher), small particle size (10-50 percent less than 1 micron), and low density (1.25-1.45 grams per cubic centimeter). As a result, these emissions are more difficult to control than emissions from metallic mineral facilities. Although high pressure drop scrubbers are routinely used in the coal preparation industry, control efficiencies cannot be routinely extrapolated to the metallic minerals industry because of the difference in emission characteristics. For these reasons, the stack mass emission standard for the metallic mineral industry is different than the standard for the coal preparation industry.

2.2.5 Comment: (IV-D-14, IV-D-18) Two commenters suggested that alternative control methods such as water sprays, dust suppressants, covers, and enclosures should be considered in addition to traditional capture and collection systems in developing the standards.

Response: These alternative control methods were not widely used relative to other control devices in the metallic mineral industry during the development of this standard, and therefore, the economic and

environmental impacts of these alternatives were not specifically evaluated. Moreover, studies of their use in the non-metallic industry indicate that they do not achieve greater control than the traditional capture and collection systems. However, the standards do not prohibit the use of any alternative control method as long as it will meet the emission limitation. The EPA has written the standard in a format that allows the use of several control alternatives including wet suppression and enclosures to meet the emission limitations. Although the costs of these alternatives were not specifically enumerated, in some instances these systems may be appropriately used at significantly lower costs than traditional control devices. In line with the EPA's approach of showing cost under worst-case conditions, the EPA used costs of more traditional capture and control systems to determine economic impacts of the proposed NSPS.

2.2.6 Comment: (IV-D-14) One commenter stated that it would be very difficult to achieve the process fugitive emission standard at a reasonable cost at ore dumps and conveyor belt transfer points in open-pit mines and requested that the standard be withdrawn. This commenter provided data on the cost to control fugitive emissions at ore dumps and conveyor belt transfer points at in-pit crushing systems. This commenter stated that the cost to control emissions at these facilities was high enough to forestall a changeover to in-pit crushing and conveyorized transport. This changeover was being considered at an existing mine as a means to reduce energy and labor costs associated with truck hauling. The commenter also noted that the use of in-pit crushing and conveyorized transport would reduce plant fugitive emissions by 40 to 50 percent because truck hauling would be reduced.

Response: Because these new in-pit crushing and conveying systems were not in use during the development of the NSPS, the EPA has limited information regarding the industry-wide impacts of the NSPS upon these systems. Due to the lack of sufficient emission test data and data on the cost and design of effective in-pit control systems, the EPA is unable to identify the best demonstrated technology (BDT) for these facilities at this time and is, therefore, excluding truck and railcar unloading stations (ore dumps) and conveyor belt transfer points located in open-pit mines and conveyor belt transfer points located in open-pit

mines and conveyor belt transfer points located between the mine and the mill, storage, or waste disposal areas from coverage under the NSPS for metallic mineral processing at this time.

However, as a result of the comment, the EPA conducted an evaluation of the impacts associated with the control of emissions from ore dumps at in-pit crushing operations and from overland conveyor systems at one plant for which information was available. This evaluation was based on the process information supplied by the commenter for an open-pit mining operation that involves the excavation of greater than 100,000 tons of ore and 150,000 tons of waste rock per day.

Potential emissions from these ore dumps and conveyor belt transfer points at this plant are significant based on the number of facilities and the amount of material transferred through these points. The EPA calculated that the uncontrolled emissions from the ore dumps at the one facility for which data were available would likely range from 2,000 to 6,000 tons per year. Uncontrolled emissions from conveyor belt transfer points on overland conveyors could be in the range of 2,000 to 23,000 tons per year depending on the actual ore and waste-rock moisture levels.

The cost to control the emissions from these ore dumps and conveyor belt transfer points at this plant also appears significant. Although the EPA believes that some of the costs provided by the commenter are based on process designs that do not allow for the most economical use of control equipment, even the EPA's calculations for less costly designs indicate a potential economic impact on the production costs of copper of as much as 1 percent from the control of emissions from these sources alone.

The EPA notes, however, that the preliminary emission and cost information gathered from this plant suggests that the impact of controlling ore dumps and conveyor belt transfer points is potentially so great as to delay or discourage decisions to replace truck hauling systems with conveyor transport systems. This effect, if it were to occur, would be counter-productive from an environmental standpoint. The uncontrolled emissions from truck hauling are typically much greater than uncontrolled emissions from conveyor belt systems. Viewed in the broad perspective of controlling emissions from the transport of ore and waste rock, the replacement of truck hauling with conveyor belts thus

represents a very effective method for reducing emissions from the truck transport of rock, emissions that otherwise in the past have proven difficult to control. Thus, the EPA would seek to encourage this shift in process technology from the use of truck hauling to conveyor transfer.

The EPA will review the development of this transport technology and the impacts of possible control techniques for these facilities during its periodic review of this NSPS.

2.2.7 Comment: (IV-D-4) One commenter indicated that the impacts of these standards on new portable in-pit crusher and conveyor systems were not analyzed. At least one company has constructed a portable crusher for use in open-pit mines. Although not a self-powered mobile facility, this crusher is designed to be moved by heavy equipment on an annual or semi-annual basis as operations shift in the mine. Crushed ore is then transported by conveyor belt from the mine to the mill. This commenter noted that such a system of in-pit crushing and conveying of ore could reduce the fugitive emissions associated with the truck transport of ore over dirt roads because the system would reduce the number of trucks needed. An exemption from coverage by these standards was requested for portable crusher and conveyor systems in open-pit mines because analysis of the environmental, energy, and economic impacts was not performed for these facilities.

Response: The EPA requested from the company more information that would indicate that the economic, environmental, and energy impacts of these standards on portable crusher and conveyor systems would differ from impacts on fixed-site crusher and conveyor systems (docket item IV-E-4). Information received to date does not indicate a significant difference in the techniques used to control emissions from portable and stationary crushers. Likewise the technology used to unitize and transport the crusher and conveyor system can quite readily be extended to the control devices. In discussions with EPA representatives, this commenter indicated that a portable crusher under construction during proposal of this standard would use a charged droplet electrostatic precipitation to meet State standards. The EPA concludes that the cost to control emissions from portable and stationary crushers would be similar and therefore reasonable. Therefore, the Administrator believes that an exemption for

these portable crushers is not warranted. However, as discussed in the response to comment 2.2.6 above, conveyor belt transfer points between in-pit crushers and subsequent milling or waste rock disposal areas are exempted from the NSPS.

2.2.8 Comment: (IV-D-13) One commenter recommended that the EPA delete the standard for process fugitive emissions until such time that methods are developed to control the point source of process fugitive emissions. This commenter specifically cited the example of the coarse ore reclaimed from a stockpile. He claimed that process fugitive emissions from the reclaim operation would be difficult to distinguish from the open-source fugitive emissions from the stockpile itself.

Response: As discussed in the proposal BID and preamble, the EPA tested all types of affected facilities covered by this NSPS to determine the proper methods for reducing or eliminating process fugitive emissions and the levels to which these emissions could be controlled. The process fugitive emission standards are based on tests of properly designed and maintained hoods, enclosures, and air ducting systems. The EPA tests of ore reclaim operations showed that properly designed enclosures and hoods satisfactorily captured all process fugitive emissions. In addition, because ore reclaim operations would be located in tunnels or recessed areas beneath the stockpile, open-source fugitive emissions from the stockpile would not interfere with the determination of emissions from the reclaim operation.

Because the achievability of the process fugitive standard has been adequately demonstrated for the facilities now covered by this NSPS, the EPA will not delete this standard.

2.2.9 Comment: (IV-D-17) One commenter indicated that the opacity standard for process fugitive emissions may be difficult to achieve in arid areas where fairly strong winds are common and the individual process units are not located in an enclosed area. The commenter suggested that the final rulemaking consider these situations.

Response: The EPA tested many process units under windy conditions. Such windy conditions will require enclosures at the emission sources. Such enclosures need not encompass the entire piece of process equipment; rather they can be limited to the area at which emissions could escape to the open air. The efficient use of enclosures is common in the

industry and greatly reduces the air flow requirements at emission sources. EPA tests indicate that the efficient use of enclosures will greatly facilitate the achievability of the process fugitive emission standard even under windy and arid conditions.

2.2.10 Comment: (IV-D-2) One commenter stated the emissions from a wet scrubber planned for installation at a new facility were estimated to be 0.093 g/Nm^3 using vendor information and uncontrolled emission factors from the EPA's Compilation of Air Pollutant Emission Factors (AP-42) and State reference material. This estimated emission rate would exceed the stack emission standard set by this NSPS.

Response: This commenter was contacted to obtain more information on the basis for this controlled emission estimate (docket item IV-E-8). The commenter stated that the uncontrolled emissions were assumed to be approximately 12 grains/standard cubic foot (scf) based on their interpretation of emission factors provided in the EPA document AP-42. The EPA representative pointed out that the AP-42 factors used by the commenter have been revised recently by the EPA to specify emissions by ore moisture conditions and that their estimates of uncontrolled emission rates are very high for any conditions at crushing and material transfer operations. In addition, EPA testing at an existing facility at the same location as the planned facility showed uncontrolled emissions of less than 1 grain/scf. Therefore, considering a more reasonable estimate of uncontrolled emissions and their scrubber vendor guarantee of 99.7 percent removal efficiency, it is reasonable to believe that the stack emission standard can be achieved.

2.3 MODIFICATION AND RECONSTRUCTION

2.3.1 Comment: (IV-D-14) Citing the ASARCO and the Alabama Power decisions, one commenter stated that the entire reconstruction provision is unlawful and should be deleted. This commenter interpreted the Clean Air Act (Section 111(a)(4)) to indicate that the NSPS should only apply to modifications to existing facilities that cause an increase in emissions.

Response: Since in enacting Section 111 Congress did not define the term "construction," the question arose whether NSPS would apply to facilities being rebuilt. Noncoverage of such facilities would have produced the incongruity that NSPS would apply to completely new facilities but not to facilities that were essentially new because they had undergone

reconstruction of much of their component equipment. This would have undermined Congress' intent under Section 111 to require strict control of emissions as the Nation's industrial base is replaced.

EPA promulgated the reconstruction provisions in 1975, after notice and opportunity for public comment (40 FR 58420, December 16, 1975), to fulfill this intent of Congress. Since this turnover in the industrial base may occur independently of whether emissions from the rebuilt sources have increased, the reconstruction provisions do not focus on whether the changes that render a source essentially new also result in increased emissions.

Congress did not attempt to overrule EPA's previous promulgation of Section 60.15 in passing the Clean Air Act Amendments of 1977. This indicates that Congress viewed the reconstruction provisions' focus on component replacement, rather than emissions level, as consistent with Section 111. See, e.g., Red Lion Broadcasting Co. v. FCC, 395 U.S. 367 (1969); NLRB v. Bell Aerospace Division, 416 U.S. 267 (1974). Nor has any Court questioned the Agency's authority to subject reconstructed sources to new source performance standards.

As the commenter correctly notes, the Court of Appeals for the D.C. Circuit, in ASARCO v. EPA, 578 F.2d 319, 327 n.24 (D.C. Cir. 1978), stated that:

> The Act's language . . . is aimed at new sources, not just new construction, and defines existing sources that are altered so that their emissions increase as new sources.
>
> Id. (Emphasis in original.)

Contrary to the commenter's contention, however, this passage, as well as the passage the commenter quoted from the first Alabama Power decision, Alabama Power Co. v. Costle, 606 F.2d 1068, 1081 (D.C. Cir. 1979), indicates merely that Section 111 defines existing sources with increased emissions as "modified" sources subject to "new source" performance standards. Those passages do not mean, either explicitly or by implication, that existing sources undergoing such extensive component replacement that they are essentially newly constructed should not be considered newly "constructed" sources made subject to "new source" performance standards through Section 111(a)(2). To the contrary, in ASARCO the Court implicitly approved the EPA's treatment of these reconstructed sources as "new sources" subject to NSPS. (ASARCO, 578 F.2d

at 328 n.31) In fact, the Court suggested in that case that the reconstruction provisions may not go far enough toward preventing possible abuses by owners seeking to avoid NSPS by perpetuating the useful lives of their existing facilities indefinitely through gradual component replacement.

The commenter also claims incorrectly that the D.C. Circuit's opinions in the first and second Alabama Power Co. v. Costle decisions, supra and 636 F.2d 323, 401 (D.C. Cir. 1979), preclude the EPA from finding reconstructed sources to be "new sources" subject to NSPS when their emissions have not increased. In the excerpt quoted by the commenter, the Court was addressing the issue of whether, for purposes of deciding the applicability of the prevention of significant deterioration (PSD) provisions to an existing facility, a change increasing emissions from one part of the plant would subject that narrow set of equipment to the PSD review process as a "modification", even when overall plant emissions had not increased. The Court upheld the EPA's decision not to find this type of change to be a "modification", relying primarily on the following reasoning:

> According to their stated purposes, the PSD provisions seek to assure that any decision to permit increased air pollution in any area to which this section applies is made only after careful evaluation of all the consequences of such a decision and after adequate procedural opportunities for informed public participation in the decisionmaking process. Congress wished to apply the permit process, then, only where industrial changes might increase pollution in an area, . . .
>
> Id. (Emphasis in original.)

For two reasons, this reasoning and, therefore, the Alabama Power rulings do not undermine the Agency's authority to subject reconstructed source to NSPS when emissions from the source have not increased. First, in contrast to the purposes of the PSD program, the primary purpose of the NSPS program is not to control emissions to produce a particular ambient effect in a particular area. Rather, its purpose is to effect a gradual reduction in emissions as the nation's industrial base is replaced. For the reasons described above, this goal is furthered by applying NSPS to any equipment that has undergone substantial component replacement, regardless of the level of emissions before and after the change. Second, the Court in Alabama Power was not addressing the NSPS

reconstruction provisions; it construed the definition of "modification", merely for PSD purposes. As described above, when the Court did address the reconstruction provisions in the NSPS area -- in the ASARCO footnote cited above -- it did not question their validity, but instead implicitly upheld them when it suggested that those provisions do not go far enough to serve the goals of Section 111.

2.3.2 Comment: (IV-D-10) One commenter noted that under the proposed standards any new or substantially rebuilt piece of equipment would become subject to the proposed emission and opacity limits. This commenter noted that if one of several units that are vented to a common emission control device should be replaced or substantially rebuilt, the replacement equipment would fall under the standards as a new source while other similar units would remain unaffected. The commenter questioned whether the EPA would require a separate emission control system for the one unit that was already part of an overall control system. This commenter recommended that a plant have the option of incorporating the emissions from the replacement unit into the general control system provided the plant reduces the overall emissions by an amount equal to that amount that would have been reduced had the affected unit been a separate system and had the NSPS applied to it.

Response: The commenter is correct that an affected facility that is new (in this case, a replacement) or is substantially rebuilt, would be subject to the standards. The owner would have two alternative means through which compliance could be achieved. One would be to install a separate control device. The other would be to upgrade the existing control device such that if the new or replacement facility were ducted to the common control device, the total emissions conform to the standard. The effect of these is consistent with the intent of Section 111 of the CAA, which is to cause new air pollution sources to install BDT.

The alternative of ducting the emissions from new facilities into existing technology that is less effective than BDT, would not result in the emission reductions and attendant air quality benefits envisioned by Section 111. The alternative presented by the commenter would involve obtaining emission reduction credits from an existing facility to offset the amount by which the new facility exceeds the level attainable with BDT. This is not appropriate for several reasons. First, this is

inconsistent with the primary purpose of Section 111, which is to reduce emissions to a minimum through the use of BDT. In addition, this alternative creates a number of enforcement uncertainties, one of which is the question of what would happen if the new facility has a longer life than the facility from which the emission reduction credits were obtained. Moreover, implementation of such an approach would require (1) precise pre-construction information on expected actual emission rates and (2) assumptions about the future relative inputs of the multiple units to the common control device. In the first instance, although it is presumed that the facilities in question would be meeting State standards, inherent variability in performance of the control device would make it difficult to pick a baseline emission level against which to measure improvement. This variability would make it very difficult to differentiate between actual emission reductions and calculated reductions that may or may not actually occur. In the second instance, where several different types of equipment were ducted in common, it would be difficult not only to apportion emissions among them as a base for determining reduction but to assess the long-term constancy of that apportionment once it is made. Indeed, if a baghouse were used, the application under such an arrangement of an opacity limit capable of assuring the BDT emission reduction, would be infeasible.

2.3.3 Comment: (IV-D-13) One commenter was concerned about the reconstruction provisions of the regulation. He stated that maintenance activities for ore contact surfaces on dust collection ductwork, chute liners, vents, and pans on pan feeders should be exempted from the reconstruction provisions and that the definition of facilities whose repairs and replacements are exempted from reconstruction consideration should be expanded to include: "all surfaces subject to abrasion by direct contact with ore." This commenter also requested that catastrophic repair be exempted from the reconstruction provisions. For example, a large piece of metal jammed in a crusher can cause severe damage to the crusher, its motor, electrical components, etc. Repair of this facility is unplanned and not intended to upgrade and modify equipment or technology, and the commenter felt it would be unreasonable to classify such equipment as reconstructed and subject to the NSPS.

Response: The reconstruction provisions apply only to those facilities listed as affected facilities in the regulation. Dust collection ductwork, vents, and chute liners are not listed as affected facilities. In addition, it should be noted that dust collection ductwork and vents would be considered part of the emission control system, whose repair or replacement is exempt from the reconstruction regulation as well as exempt from the modification provision, 40 CFR 60.14, so long as these actions do not result in an increase in emissions. Pan feeders are defined as part of the crusher affected facility under Section 60.381. Because the ore contact surfaces on feeders could be subject to the same repair frequency as other ore contact surfaces, the definition of ore contact surface is expanded to include pan feeders. A general exemption for all ore contact surfaces is not included because of the inherent difficulty in applying such general language, that is, a general exemption would be too ambiquous.

Repairs to a facility that occur as a result of an unplanned or catastrophic occurrence are not exempted from reconstruction considerations unless they are covered under the ore contact surface exemptions. The reconstruction provisions apply in a straight-forward manner to any existing facility undergoing substantial component replacement. Neither the language nor the purpose of either Section 60.15 nor the definition of "new source" in Section 111 supports an exemption based on the owner's reasons for replacing the facility component.

2.4 ECONOMIC IMPACTS

2.4.1 Comment: (IV-D-7, IV-D-8, IV-D-9, IV-D-11, IV-D-18) A number of commenters discussed various aspects of the economic impacts of the proposed standards. One commenter (IV-D-7) stated that the proposed standards have lost sight of the primary purpose of the Clean Air Act, which is to promote "the public health and welfare and the productive capacity of its population." This commenter questioned the necessity of additional regulation of an industry that is struggling under the competition of the world market. Four commenters (IV-D-8, IV-D-9, IV-D-11, IV-D-18) noted that the economic analyses were performed with 1979 cost and price data that are out of date. Production prices have risen since then while in many cases product prices have fallen. For example, one commenter noted that cost of producing copper increased

44 percent from 1978 to 1981. The cost of copper, on the other hand, fell from a dollar per pound in 1979 to 65¢ to 75¢ per pound in 1982. The impact of these standards would be correspondingly more severe at these lower prices. An increase in price cannot be passed on because of world-wide competition in the copper market. A similar situation was presented for the aluminum industry. These commenters generally requested that the economic impacts of the standards be reevaluated in light of the weaker economic conditions of the industry today.

Response: The Agency recognizes that since the original economic analyses were performed in developing these standards many segments of the metallic mineral processing industry have experienced severe economic disruptions. The demand for many metals has fallen significantly with a corresponding drop in price. Even at the price figures quoted in 1979 and 1980 for some metals it was questionable that new processing plants could be profitably built unless there was a reasonable prospect for an increase in demand and price. Nonetheless, the Agency believes that, because of the central role the metallic mineral processing industry plays in the American economy, the long term prospects for growth in the industry are good. This belief is obviously shared by others outside the government as the acquisition of several metallic mineral and metal processing firms by still larger natural resource-based companies would attest.

Long-term optimism does not completely redress the short-term difficulties in the industry, yet it is this severe drop in the demand and price for metals - and not environmental regulations - that makes the new construction unlikely at present. When the demand for metals increases with a corresponding increase in price to levels more comparable to 1979 prices (in constant dollars), then new construction will be more likely. Thus, it is reasonable to calculate the impact of these standards for new facilities by using the price of the commodity that is a minimum requisite for the construction of a new facility.

The EPA recognizes that the costs of constructing a new metallic mineral processing plant have likely increased in the past several years. The cost of control equipment has also increased in a proportionate manner. Thus, the costs of control equipment as a percentage of processing equipment cost remained relatively constant. A large manufacturer of

crushers has quoted price increases of 21 to 24 percent between January 1, 1980, and January 1, 1983 (docket item IV-E-6). During the same period, a manufacturer of control devices has quoted price increases of 20 to 22 percent for multi-vane and venturi wet scrubbers (docket item IV-E-7). At the point at which the rise in the price of metals makes it reasonable to invest in new plants, the cost of meeting the standards will have the same relatively insignificant impacts shown in the analyses based on 1979 dollars.

In addition, the possible economic impacts of the proposed standards are based on several assumptions that tend to exaggerate the impacts, particularly at copper plants. As noted elsewhere in these responses, the economic analysis assumes the universal use of high-energy scrubbers when in fact less costly low-energy scrubbers or baghouses can meet the standards at many locations. In addition the concentration of copper in ore at small copper mines was assumed to be 0.45 percent. This figure is more typical of large deposits of larger copper mines, which, because of their economics of scale, can operate at these lower concentrations. One recently expanded mine and mill in Arizona has the capacity to process about 1,700 tons per hour of ore containing 0.49 percent copper and 0.02 percent molybdenum. On the other hand, smaller copper facilities require higher mineral concentrations. New information developed since the original economic analyses were performed indicates that a facility in the planning stage in New Mexico would process about 100 tons of ore per hour containing about 2 percent copper and 3 percent zinc instead of the 0.45 percent copper concentration assumed in the economic analysis for small copper plants. With a higher copper concentration and the consequent higher production of concentrates and the concurrent processing of by-products, the impact of the proposed standards on the production price of metals would be greatly reduced at these smaller plants. Even assuming the universal use of high-energy scrubbers, the economic impact of the standards on copper prices at this planned plant in New Mexico would be closer to 0.17 percent than the 1.7 percent figure quoted for 150 ton per hour copper plants in preamble and the BID for the proposed standards.

The EPA is very sensitive to the possible adverse economic impacts of the NSPS. For that reason, the Agency has examined very carefully

the capital costs of controls, the ability of firms to finance these costs, the potential price increases, and the cost per ton of emissions reduced, which addresses the issue of control costs relative to other industries. As discussed in the proposal preamble, none of these projected impacts appear unreasonable. More specifically, with the one exception discussed above, the projected price increases were all less than 1 percent and typically less than 0.5 percent. In balancing the protection of public health and welfare against the productive capacity of this industry, these costs appear reasonable and, in fact, are small compared to other factors that affect costs and prices.

The EPA has been extremely conservative in calculating the economic impacts of the proposed standards. As demonstrated by our original analyses and the discussion above, the proposed standards will not deter new construction when the demand for metals provides the economic conditions conducive to the development of new plants. Therefore, an extensive reevaluation of the economic impacts of the standards is unnecessary.

2.4.2 Comment: (IV-D-18) One commenter stated that the discussion of costs in the proposal BID (Chapter 8) based on the use of building evacuation techniques at lead smelters to comply with the lead NAAQS, should be revised because the technique is unworkable. The commenter cited a case in which building evacuation caused other problems.

Response: Section 8.2 of the proposal BID is provided to alert the public to the other regulatory costs affecting the industry in addition to those resulting from the proposed standards. The cost data provided in Section 8.2 are based on the best information available at the time and typically assume the use of certain control techniques. The mention of a specific technique should not be interpreted as an endorsement of its use under all conditions. Lead smelters are, of course, not covered by the proposed NSPS, and it is beyond the scope of the BID to review the applicability of all control techniques for segments of the industry not covered by the proposed standards for metallic mineral processing.

2.5 ENVIRONMENTAL IMPACTS

2.5.1 Comment: (IV-D-11, IV-D-14, IV-D-16, IV-D-18) Several commenters stated that the air quality benefits attributable to the proposed standards were overstated because the emission reduction attributable to the

proposed standards was overestimated. These commenters gave several reasons why the emission reduction was overestimated. They reiterate that the Agency assumed that the entire industry would be operating under worst-case conditions when calculating the emissions that would occur if the NSPS were not promulgated and if current State standards were allowed to continue. They pointed out that the EPA's own testing indicates that facilities operating under State standards with low-energy wet scrubbers or baghouses are achieving much lower emission rates than EPA's worst-case estimates. One commenter (IV-D-14) calculated that the true emission reductions with the promulgation of an NSPS would be closer to a 1000 tons per year as opposed to the EPA's estimate of 14,000 tons per year. These commenters also note that the number of new metallic mineral plants predicted by the EPA is overestimated, particularly in the copper and iron ore industry. Thus, the increase in industry emissions that would occur from new plants if the NSPS were not promulgated is overestimated. Finally, one commenter (IV-D-14) noted that new plants often replace old plants; these old plant emissions should be subtracted from the industry's emissions when calculating an increase in industry-wide emissions if the NSPS were not promulgated.

Because the technology that must be employed to meet other Clean Air Act requirements will reduce new source particulate emissions to insignificant levels and because of the bleak outlook for future growth in this industry, three of these commenters (IV-D-14, IV-D-16, and IV-D-18) requested that the NSPS be withdrawn and that the industry be deleted from the NSPS priority list.

Response: The EPA's estimates of the impacts of various regulatory alternatives must be seen as that, as estimates made at a point in time with the best information at hand. In predicting the likelihood of new facilities in the industry, the EPA consulted the best sources available, including the U.S. Bureau of Mines, industry representatives, technical journals, and State agencies. Typically, these sources do not specify particular new plant developments in their forecasts because of various constraints. However, these sources do make various industry forecasts in terms of long-range demand, sources of supply, and growth in the industry. On this basis, the EPA developed models of new plants on which to base its predictions of the costs and environmental impacts of new standards.

Since the time the EPA first developed these predictions, the metallic mineral industry has experienced severe economic difficulties. Numerous plants have suspended or reduced operations, and some new plant construction has been postponed. Nonetheless, the EPA believes that, because of the central role the metallic mineral processing industry plays in the American economy, the long term prospects for growth in the industry are good and the current difficulties experienced by industry are only temporary.

In predicting the environmental impacts of various regulatory alternatives, several methods could be used. The EPA could have chosen to estimate the emissions that would occur if the State standards were applied at new plants assuming that these emissions would be the maximum allowed by the States. There are several problems with this approach. State regulation of metallic mineral facilities was not consistent from State to State or even within a State as to type of facilities at a plant that might be required to meet State standards. Much of this difficulty arose from the application of the term "unit process" to plants when applying process weighted emission limitations. In addition, affected facilities under the proposed standards might not be covered at some locations if State standards continued. On the other hand, the Agency's survey of the industry indicated that many plant facilities covered by State standards were doing better than State standards and that a percentage of the new plants might be expected to do likewise.

Alternately, the Agency could assume the average emission level measured at facilities that the EPA actually tested. There are also problems with this approach. The Agency could not perform an exhaustive test survey of all types of facilities in the industry to determine what the current emission levels are in the industry. Such a test program would not have been a wise use of tax dollars and would not have fulfilled the primary purpose of the EPA's test program. The EPA selects and tests well-designed and well-maintained types of control devices to determine the levels of performance. Some facilties that the EPA inspected, but did not test, were operating with control system designs, devices, or maintenance programs that were not best systems; although, they were meeting State standards. For example, some facilities are able to use dry cyclones to meet State standards. These control devices were not

tested because they are not examples of best systems of continuous emission reduction.

Therefore, the Agency decided to use the so-called "worst-case" approach in calculating emission impacts of the various regulatory alternatives. This approach assumes a baseline emission level equivalent to the emissions from a low pressure drop scrubber operating under worst-case conditions. The EPA agrees that this approach will not predict the true impact of the proposed standard at each and every new plant that might be built. However, compared to the results of other predictive methods, the Agency feels this method gives a valid overall indication of the impact of the standard. Although the "worst-case" method will overestimate the impact at some facilities it will not do so as greatly as using the maximum emissions allowed by the States as a basis for calculating the impacts. On the other hand, the "worst-case" approach presumes the use of a wet scrubber that may provide better control than a dry cyclone. The "worst-case" approach also presumes coverage of all affected facilities at a plant by the State standards even though State standards may not consistently require control devices on all of these facilities. Uncontrolled emissions from these facilities could easily be higher than "worst-case" baseline emissions of 0.15 gr/dscf. Also, the EPA did not specifically enumerate the reconstruction of facilities at existing plants in estimating emission reductions. The "worst-case" approach used to calculate the environmental benefit of the standard also corresponds to the approach used to calculate the control cost of the standard.

Although the estimates of environmental impacts are approximations, they indicate significant emission reductions such that the NSPS will not result in unnecessary regulation as claimed by some commenters. Because of the expected long-term growth in the industry arising from the construction of new facilities and the reconstruction of existing facilities, this source category will remain listed as a significant source on the priority list for which standards of performance will be promulgated.

2.5.2 Comment: (IV-D-14) One commenter proposed that, if the Agency could not be persuaded to withdraw the standards for reason of minimal environmental impact, then the standards should be applied only to

dryers not covered by the smelter standards. This commenter noted that dryers were the only facilities that the EPA tested that did not meet the proposed standards with the low pressure drop scrubber. This commenter also noted that most new facilities will use wet grinding operations (which do not require control devices) instead of dry secondary and tertiary crushing operations as proposed in the EPA's model new plants.

Response: As noted elsewhere in this document, the Agency tested examples of well-designed and well-maintained control devices. The EPA's survey of the industry under Section 114 of the Clean Air Act indicates that there are facilities in addition to dryers in this industry that are operating with devices that are not best systems of continuous emission reduction and that emit particulate matter at levels higher than the proposed standards.

The use of wet grinding has increased in the industry during the recent past. However, combined crushing and grinding facilities have been designed and are possible in the future as discussed in the Background Information Document prepared for the proposed standard. Therefore, the Agency will continue the inclusion of all types of dry crushing operations in the standards.

2.6 ENERGY IMPACTS

2.6.1 Comment: (IV-D-11, IV-D-14) Two commenters noted certain liabilities with the use of high-energy wet scrubbers. Additional energy consumption from high-energy scrubbers could be the equivalent of 50,000 barrels of oil a year. Even though this is a small percentage of total plant use, it is still a significant quantity. Additionally, the noise levels from high-energy wet scrubbers will be higher than from low-energy scrubbers and will increase personnel noise exposure.

Response: The EPA is aware that the energy consumption of high-energy wet scrubbers is a significant percentage of their annualized cost. On an industry-wide basis, however, the use of baghouses and low- and medium-energy scrubbers will greatly reduce the overall energy impacts. Even assuming the universal application of high-energy scrubbers, which is highly unlikely, their energy consumption would be less than one-half of 1 percent of the total energy consumption of new plants.

The noise levels associated with wet scrubbers, though not as high as processing equipment such as crushers, may still require hearing

protection for workers in close proximity. The placement of scrubbers at roof level will mitigate some of these impacts.

2.7. TEST METHODS AND MONITORING

2.7.1 Comment: (IV-D-2, IV-D-3, IV-D-12, IV-D-13, IV-D-14, IV-D-15, IV-D-16, IV-D-18, IV-D-19) A number of commenters noted that no method is specified in the proposal for the determination of the opacity of process fugitive emissions or stated that Method 9, which is specified in the General Provisions, is not appropriate for this measurement. These commenters note that Method 9 was developed for reading opacity at stacks and that the diffuse nature of process fugitive emissions will render Method 9 readings highly variable and subjective. Further, the data used in setting the standard are inappropriately based on Method 9 results in that no procedures for measuring opacity of process fugitive emissions are provided in Method 9. The commenters recommended that the process fugitive emission standard be deleted until an appropriate method is developed.

Response: As stated in the General Provisions (40 CFR 60.11), Method 9 is the method specified for the determination of opacity. The Agency agrees that Method 9, as written, does not provide sufficient guidance for the measurement of opacity levels from process fugitive sources. During the data collection in support of the metallic minerals processing regulation, observers trained in the use of Method 9 followed the guidelines of the method with some modifications in recording visible process fugitive emission data. Method 9 has been amended to incorporate these modifications, which explain in more detail how the opacity of visible process fugitive emissions is determined. The amendment emphasizes the correct positioning of observers and the location within the visible fugitive emissions where opacity readings are to be made.

2.7.2 Comment: One commenter (IV-D-9) noted that the certification section in Method 9 requires readers to achieve an average observational error of no greater than 7.5 percent. The commenter suggested that any opacity standard set below ths 7.5 percent level is inconsistent with Method 9 because it requires the observer to be more precise than required by the certification section (which the commenter contends governs the issue of what error enforcement personnel must consider). The commenter also implied that, by not allowing full use of an average 7.5 percent

negative error, the proposed 7 percent stack opacity standard somehow penalizes the facility owner. Another commenter (IV-D-8) advanced a similar argument.

Response: The introductory paragraphs in Method 9 describe the "positive observational error" to be taken into account for the enforcement purposes. (Positive error is a reading higher than the actual opacity level.) The purpose of these paragraphs is only to insure that sources subject to opacity standards are not penalized for apparent violations that are due to observational error. The paragraphs do not suggest, nor is it true, that Method 9 is not accurate enough to establish and enforce opacity standards as low as 0 percent opacity. See 40 C.F.R. §60.302 (0 percent opacity standards in NSPS for grain elevators); 40 C.F.R. §60.372 (0 percent opacity standard in NSPS for lead acid battery manufacturing).

It is unclear how an owner could be penalized for not "accounting" for negative error in enforcement proceedings. Negative error is the degree to which a reading is lower than the actual opacity level. Inaccurately low readings can only benefit facility owners. For this reason, observers need not compensate for them to avoid penalizing owners unfairly.

Moreover, contrary to the commenters' suggestions, Method 9 does not require that the maximum 7.5 percent positive error discussed in the section entitled Certification Requirements be taken into account for enforcement purposes. The only portion of Method 9 addressing the enforcement issue is the introductory section. That section requires that the accuracy of the method be considered for enforcement purposes and describes that accuracy in terms of the following ranges of positive error derived from extensive data obtained in the field:

1) For black plumes . . ., 100 percent of the sets were read with a positive error of less than 7.5 percent opacity; 99 percent were read with a positive error of less than 5 percent opacity.

2) For white plumes . . ., 99 percent of the sets were read with a positive error of less than 7.5 percent opacity; 95 percent were read with a positive error of less than 5 percent opacity.

This language does not suggest an average positive error of 7.5 percent.

Nor is it appropriate to consider for enforcement purposes the maximum average 7.5 percent error that observers are permitted for qualification purposes under the certification section. During the certification test, the observer is challenged with plume opacities that are randomly varied from 0 to 100 percent opacity for each group of 25 readings. This contrasts sharply with the range of opacities with which qualified readers are typically challenged on field inspections. In the field, an observer can expect that opacities from a given stack will usually vary within only a narrow range during the 6-minute time span encompassing a set of 24 readings. In the Administrator's judgment, an observer's error, when reading plumes with relatively constant opacity levels, will be significantly less than the observer's error when reading a full range of randomly varied opacity levels. Since readers enforce opacity limits in the field, the EPA properly required that the range of error demonstrated under field conditions, rather than the maximum allowable average error associated with certification testing in an artificial environment, be considered for enforcement purposes.

2.7.3 Comment: (IV-D-8, IV-D-9, IV-D-13, IV-D-15) A number of commenters noted that as Method 9 readings are collected in increments of 5 percent opacity, the emission limit should be stated as an increment of 5 percent opacity.

Response: Opacity results from Method 9 tests represent the average of 24 readings over a 6-minute period. While each reading is recorded as an increment of 5 percent opacity, the average of all the readings can be any value. The new source performance standard is based on 6-minute averages and, therefore, is not limited to an interval of 5 percent opacity.

2.7.4 Comment: (IV-D-9) One commenter suggested that the opacity data be normalized for stack diameter and that a statistical analysis be included in the procedure.

Response: The new source performance standard support data represent measurements from different stack sizes and configurations. The recommended emission limit accounts for differences between stack configurations in that the limit is set above the highest observed values. There is no need to perform any further statistical evaluation

or normalization of the data in order to show compliance with an emission standard set in this manner.

The opacity standard for stack emissions would be applicable in all cases unless the EPA were to approve establishment of a special opacity standard under the provisions of 40 CFR 60.11(e). The provisions allow an owner or operator to apply to the EPA for establishment of a special opacity standard for any source that meets the applicable concentration standard (demonstrated through performance tests under conditions established by the EPA) but is unable to meet the opacity standard despite operating and maintaining the control equipment so as to minimize opacity. A special opacity standard might be established, for example, where an unusually large diameter stack precludes compliance with the proposed opacity standard.

2.7.5 Comment: (IV-D-11) One commenter stated that the requirement for initial performance tests was extremely costly particularly at plants with up to 25 control devices. At $5,000 to $9,000 per test, this could cost up to $250,000.

Response: Initial performance tests are required by the General Provisions (40 CFR 60.8). Although their cost is a relatively small percentage of the cost of control equipment, which in turn is a relatively small percentage of the capital cost of new plants, the EPA recognizes that the cumulative cost of these tests can be significant. Several factors should be seen as mitigating these costs. At plants with a large number of control devices economies of scale would reduce the cost of testing to at least the lower end of the price range quoted above. In addition, the General Provisions (40 CFR 60.8(b)) provide authority for waiving of performance tests. For example, the enforcing agency could limit testing to a representative sample of similar control devices at a specific site.

2.7.6 Comment: (IV-D-11, IV-D-12, IV-D-18) Several commenters provided comments on the requirements for wet scrubber monitoring devices. One commenter (IV-D-11) stated that the wet scrubber monitoring devices are costly and unnecessary because the Background Information Document showed that most devices were operating properly with zero opacity. The two other commenters suggested that the regulation be clarified to indicate that opacity limits on baghouses and wet scrubber monitoring

devices were meant as quick performance checks and that continuous performance records are not required.

Response: As discussed in the preamble and in Chapter 4 of the BID for the proposed standards, some wet scrubbers showed no stack opacity; however, as a whole the stack emission opacity data collected during the tests of wet scrubbers were inconclusive due to their high variability. Some of the highest opacity readings (e.g., 25 percent) were observed at low outlet particle concentrations (e.g., 0.006 gr/dscf); while at other facilities with outlet concentrations closer to the stack emission limits, opacity was essentially zero. Therefore, an opacity standard was not proposed for wet scrubbers. Instead, the monitoring of the operating parameters of wet scrubbers (pressure drop and scrubber liquid flow rate) would be required by the proposed standards in order to provide an inexpensive and easily verifiable check of the operation and maintenance of wet scrubbers. The annualized cost of these monitors is reasonable, ranging from about 1 percent of the control device cost at large iron ore plants to 7 percent at small tungsten plants.

The EPA's experience with control devices shows that regular maintenance, both remedial and preventive, greatly enhances control equipment efficiency and reduces overall control costs. The installation of wet scrubber monitoring devices will greatly improve the ability of maintenance personnel to detect a gradual decrease in scrubber performance before a major breakdown occurs. Thus, the installation of these devices is justified in terms of insuring proper operation and maintenance of wet scrubber control devices.

The General Provisions require recordkeeping for continuous monitoring devices. Therefore, Section 60.384 of the proposed standards has been revised to clarify the type of recordkeeping required for wet scrubber monitoring devices. The owner or operator of a wet scrubber would be required to record the liquid flow rate and the change in pressure of the gas stream at the time of the initial performance test and at least weekly thereafter. The owner or operator would be required to report the liquid flow rate and the change in pressure of the gas stream at the time of the initial performance test. Semiannual reporting of the

subsequent weekly readings is only required when one or more readings of the liquid flow rate or pressure varies by more than ±30 percent from the readings of the most recent performance test.

2.7.7 Comment: (IV-D-8) One commenter noted that the accuracy requirement for liquid flow meters on wet scrubbers was upgraded from ±10% to ±5%. The commenter requested an explanation of the change.

Response: The Agency surveyed suppliers of these devices and found that they can be routinely guaranteed as accurate to at least ±5 percent. In fact, devices more accurate than those prescribed by the standard are typically the norm in the industry. Therefore, the specifications were changed in line with industry standards.

Table 2-1. LIST OF COMMENTERS ON THE PROPOSED STANDARDS OF PERFORMANCE FOR METALLIC MINERAL PROCESSING PLANTS

Docket entry number[a]	Commenter/affiliation
IV-D-1	D. L. Shepherd 2528 Avalon Avenue, Northwest Roanoke, Virginia 24012
IV-D-2	D. B. Crouch Homestake Mining Company 650 California Street San Francisco, California 94108
IV-D-3	D. G. Doughty Oklahoma State Department of Health 1000 Northeast 10th Street Post Office Box 53551 Oklahoma City, Oklahoma 73152
IV-D-4	D. E. Cochran Duval Corporation 4715 East Fort Lowell Road Tucson, Arizona 85712
IV-D-5[b]	Francis W. Giaccone Air Facilities Branch Air and Waste Management Division EPA, Region II 26 Federal Plaza New York, New York 10278
IV-D-6	E. J. Weathersbee Department of Environmental Quality 522 Southwest 5th Avenue Box 1760 Portland, Oregon 97207
IV-D-7	L. A. Pirozzoli Hecla Mining Company Post Office Box 320 Wallace, Idaho 83873
IV-D-8	J. H. Goldman, Ph.D. The Aluminum Association, Incorporated 818 Connecticut Avenue, Northwest Washington, D.C. 20006

(continued)

Table 2-1. Continued

Docket entry number[a]	Commenter/affiliation
IV-D-9	L. C. Tropea, Jr., P.E. Reynolds Aluminum Reynolds Metals Company Richmond, Virginia 23261
IV-D-10	E. R. Bingham Amax Environmental Services, Inc. 1707 Cole Boulevard Golden, Colorado 80401
IV-D-11	A. R. Coy Evans, Kitchel & Jenckes, P.C. 2600 North Central Avenue Phoenix, Arizona 85004-3099 Attorney for Phelps Dodge Corporation
IV-D-12	J. H. Boyd Newmont Services Limited Post Office Box M San Manuel, Arizona 85631
IV-D-13	C. B. Scott Union Oil Company of California Union Oil Center Box 7600 Los Angeles, California 90051
IV-D-14	K. E. Blase Prather, Seeger, Doolittle & Farmer 1101 Sixteenth Street, Northwest Washington, D.C. 20036 Attorney for Kennecott Minerals Company
IV-D-15	A. L. Scott Kerr-McGee Corporation Kerr-McGee Center Oklahoma City, Oklahoma 73125
IV-D-16	L. C. Turnock American Iron Ore Association 1501 Euclid Avenue 514 Bulkley Building Cleveland, Ohio 44115

(continued)

Table 2-1. Concluded

Docket entry number[a]	Commenter/affiliation
IV-D-17	B. Blanchard United States Department of the Interior Office of the Secretary Washington, D.C. 20240
IV-D-18	J. A. Overton, Jr. American Mining Congress Suite 300 1920 North Street, Northwest Washington, D.C. 20036
IV-D-19	J. C. Farrell Freeport Gold Company Mountain City Star Route Elko, Nevada 89801
IV-D-20	W. R. Chalker E. I. duPont de Nemours & Company Engineering Department Louviers Building Wilmington, Delaware 19898

[a]These designations represent docket entry numbers for Docket No. A-81-03. These documents are available for public inspection at: U.S. Environmental Protection Agency, Central Docket Section, West Tower Lobby, Gallery 1, Waterside Mall, 401 M Street, Washington, D.C. 20460.

[b]This memo is an internal EPA document that was inadvertently put into the docket and was subsequently withdrawn from the docket.

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(Please read Instructions on the reverse before completing)

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15. SUPPLEMENTARY NOTES
The first two documents in this series presented the environmental and economic impacts and other data upon which the standard is based.

16. ABSTRACT

Standards of performance are promulgated for the control of particulate matter from metallic mineral plants processing metallic ores into metallic concentrates containing one of the following metals: aluminum, copper, gold, iron, lead, molybdenum, silver, titanium, tungsten, uranium, zinc, and zirconium. The standards, promulgated under the authority of Section 111 of the Clean Air Act, limit stack emissions and fugitive emissions opacity. These standards apply to new, modified, and reconstructed metallic mineral processing plants. This document contains a summary of the comments on the proposal of these standards in the Federal Register, the Environmental Protection Agency's response to these comments, and any changes to the standard since proposal.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Air pollution Pollution control Standards of performance Metallic minerals processing Particulate emissions Fugitive emissions Opacity	Air pollution control	13B

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