insurance for the entire amount of required liability coverage as specified in this section. Evidence of insurance must be submitted to the Regional Administrator within 90 days after the end of the fiscal year for which the year-end financial data show that the owner or operator no longer meets the test requirements.

(7) The Regional Administrator may disallow use of this test on the basis of qualifications in the opinion expressed by the independent certified public accountant in his report on examination of the owner's or operator's financial statements (see paragraph (f)(3)(ii) of this section). An adverse opinion or a disclaimer of opinion will be cause for disallowance. The Regional Administrator will evaluate other qualifications on an individual basis. The owner or operator must provide evidence of insurance for the entire amount of required liability coverage as specified in this section within 30 days after notification of disallowance.

PART 123—STATE PROGRAM REQUIREMENTS

1. The authority citation for Part 123 reads as follows:

Authority: Resource Conservation and Recovery Act, as amended, 42 U.S.C. 6901 *et seq.;* Safe Drinking Water Act, 42 U.S.C. 300 (f) *et seq.;* Clean Water Act, 33 U.S.C. 1251 *et seq.*

2. In § 123.129, paragraph (a) is amended by designating existing paragraph (a) as (a)(1) and adding new paragraphs (a)(2) and (a)(3) to read as follows:

§ 123.129 Additional program requirements for interim authorization for phase II.

(a)(1) * * *

(2) The Administrator may authorize a State program for Phase II Components A or B, or both, even though the State program does not include liability coverage requirements, if (i) the State submitted a draft application for the component or components of Phase II interim authorization to EPA prior to [insert date of publication in the **Federal Register**], and (ii) the State commits in its Memorandum of Agreement to adopt State liability coverage requirements as quickly as practicable, but in no case later than the State's application for an additional component of Phase II interim authorization.

(3) Any State which receives interim authorization for Components A or B or both without liability coverage requirements, pursuant to paragraph (a)(2) of this section, may not receive an additional component of Phase II interim authorization unless it has liability coverage requirements in effect.

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Friday
April 16, 1982

Part VII

Environmental Protection Agency

Standards of Performance for New Stationary Sources; Lead-Acid Battery Manufacture

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 60

[AD-FRL 1718-2]

Standards of Performance for New Stationary Sources; Lead-Acid Battery Manufacture

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: This rule establishes standards of performance which limit atmospheric emissions of lead from new, modified, and reconstructed facilities at lead-acid battery plants. The standards implement Section 111 of the Clean Air Act, and are based on the Administrator's determination that lead-acid battery manufacturing facilities contribute significantly to air pollution, which may reasonably be anticipated to endanger public health or welfare. The intended effect of this regulation is to require new, modified, and reconstructed lead-acid battery manufacturing facilities to control lead emissions within the specified limits, which can be achieved through the use of the best demonstrated system of continuous emission reduction. A new reference method for determining compliance with lead standards is also promulgated.

EFFECTIVE DATE: April 16, 1982.

Under Section 307(b)(1) of the Clean Air Act, judicial review of this new source performance standard is available *only* by the filing of a petition for review in the United States Court of Appeals for the District of Columbia Circuit within 60 days of today's publication of this rule. Under Section 307(b)(2) of the Clean Air Act, the requirements that are the subject of today's notice may not be challenged later in civil or criminal proceedings brought by EPA to enforce these requirements.

ADDRESSES:

Background Information Document. The Background Information Document (BID) for the promulgated standards may be obtained from the U.S. EPA Library (MD-35), Research Triangle Park, North Carolina 27711, telephone number (919) 541-2777. Please refer to "Lead-Acid Battery Manufacture, Background Information for Promulgated Standards," EPA-450/3-79-028b.

Docket. Docket No. OAQPS-79-1, containing supporting information used in developing the promulgated standards, is available for public inspection and copying between 8:00 a.m. and 4:00 p.m., Monday through Friday, at EPA's Central Docket Section, West Tower Lobby, Gallery 1, Waterside Mall, 401 M Street SW., Washington, D.C. 20460. A reaonable fee may be charged for copying.

FOR FURTHER INFORMATION CONTACT: Mr. Gene W. Smith, Standards Development Branch, Emission Standards and Engineering Division (MD-13), U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711, telephone number (919) 541-5624.

SUPPLEMENTARY INFORMATION:

The Standards

The promulgated standards will limit atmospheric lead emissions from new, modified, or reconstructed facilities at any lead-acid battery manufacturing plant which has the design capacity to produce in one day batteries which would contain, in total, an amount of lead equal to or greater than 5.9 Mg (6.5 tons). The facilities which are affected by the standards and the emission limits for these facilities are listed below:

Facility	Lead emission limit
Lead oxide production	5.0 mg/kg (0.010 lb/ton).
Grid casting	0.40 mg/dscm (0.00018 gr/dscf).
Paste mixing	1.00 mg/dscm (0.00044 gr/dscf).
Three-process operation	1.00 mg/dscm (0.00044 gr/dscf).
Lead reclamation	4.50 mg/dscm (0.00196 gr/dscf).
Other lead emitting operations.	1.00 mg/dscm (0.00044 gr/dscf).

The emission limit for lead oxide production is expressed in terms of lead emissions per kilogram of lead processed, while the limits for other facilities are expressed in terms of lead concentrations in exhaust air.

A standard of 0 percent opacity is promulgated for emissions from lead oxide production, grid casting, paste mixing, three process operation, and "other lead-emitting" facilities. A standard of 5 percent opacity is promulgated for lead reclamation facilities. The promulgated standards also require continuous monitoring of the pressure drop across any scrubber used to control emissions from an affected facility to help insure proper operation of the scrubber. Performance tests are required to determine compliance with the promulgated standards. A new reference method, Method 12, is to be used to measure the amount of lead in exhaust gases, and Method 9 is to be used to measure opacity. Process monitoring is required during all tests.

In the preamble to the proposed regulation, the decision by the Administrator not to propose standards for sulfuric acid mist emissions from the formation process was discussed. The public was specifically invited to submit comments with supporting data on this issue. Only one comment addressing this issue was received and, while the commenter suggested that acid mist emissions need EPA attention, no specific information was provided to refute the basis for the Administrator's decision not to regulate. Therefore, the Administrator does not plan to take any further action regarding acid mist emissions from lead-acid battery manufacture at this time. EPA is required to review new source performance standards four years from the date of promulgation, and if appropriate, revise them. The decision not to regulate acid mist emissions may be reconsidered at that time.

Summary of Environmental, Energy, and Economic Impacts

There are approximately 190 lead-acid battery manufacturing plants in the United States, of which about 100 have been estimated to have capacities above the small size cutoff. These plants are scattered throughout the country and are generally located in urban areas near the market for their batteries. Projections of the growth rate of the lead-acid battery manufacturing industry range from 3 to 5 percent per year over the next 5 years. Most of the projected increase in manufacturing capacity is expected to take place by the expansion of large plants (producing over 2000 batteries per day).

In general, States do not currently regulate atmospheric lead emissions from lead-acid battery plants. However, State implementation plan (SIP) particulate regulations generally require some control of these emissions. The average degree of control required by SIP regulations was used as a baseline for the assessment of the environmental and economic impacts of the new source performance standards for lead-acid battery manufacture. At some existing plants, emissions are controlled to a greater extent than is required by typical State particulate regulations. In addition, States are developing implementation plans to insure the attainment and maintenance of the national ambient air quality standard (NAAQS) for lead, which was promulgated in December 1977 (42 FR 63076). The State implementation plans for lead are expected to include regulations which will require more control of atmospheric lead emissions

than is currently required under typical State particulate regulations.

New facilities and facilities undergoing modification and reconstruction in the United States over the next 5 years would emit about 95 Mg (104 tons) of lead to the atmosphere in the fifth year, if their emissions were controlled only to the extent required by current State particulate regulations. The promulgated standards will reduce potential lead emissions from new, modified, and reconstructed facilities to about 3.1 Mg (3.4 tons) in the fifth year. The promulgated standards will also result in decreased nonlead particulate emissions from affected facilities, since equipment installed for the purpose of controlling lead-bearing particulate emissions will also control nonlead-bearing particulate emissions.

For a new or completely reconstructed plant using impingement scrubbing to control lead emissions from the grid casting and lead reclamation facilities and fabric filtration to control emissions from all other affected facilities, the fractional increase in the lead content of plant wastewater attributable to the standards will be about 0.6 percent. It is anticipated that, in early 1981, EPA's Office of Water and Waste Management will propose a regulation which would require zero lead discharge in the wastewater from grid casting and lead reclamation facilities. In order to achieve zero discharge from these facilities, scrubber effluent would have to be clarified and recycled. Although not directly attributable to the promulgated NSPS for air emissions, the costs of clarifying and recycling blowdown from scrubbers controlling grid casting and lead reclamation emissions has been considered in the development of the promulgated NSPS. The annualized cost of controlling water emissions from grid casting and lead reclamation facility scrubbers would be less than 1 percent of the costs attributable to the promulgated standards for a completely modified or reconstructed 2000 battery-per-day plant. The promulgated NSPS will not have a significant impact on emissions of solid waste.

The energy needed to operate control equipment required to meet the promulgated standards at a new plant will be approximately 2.7 percent of the total energy needed to run the plant. The incremental energy demand resulting from the application of the promulgated standards to new, modified, and reconstructed facilities over the next five years will be about 2.8 gigawatt hours of electricity in the fifth year. The fifth-year increase in demand for heat energy resulting from the promulgated standards will be about 50 PJ/yr (48×10^9 BTU/yr), or the equivalent of about 8.1 thousand barrels of oil per year.

The capital cost of the installed emission control equipment necessary to meet the promulgated standards on all new, modified, and reconstructed facilities during the first five years of the standards will be approximately $8.2 million. The total annualized cost of operating this equipment in the fifth year of the standards will be about $3.9 million.

These costs and energy and environmental impacts are considered reasonable, and are not expected to prevent or hinder expansion on the lead-acid battery manufacturing industry. Economic analysis indicates that, for plants with capacities larger than the small size cutoff, the costs attributable to the standards can be passed on with little effect on sales. The average incremental cost associated with the promulgated standards will be about 30¢ per battery. This is about 1.6 percent of the wholesale price of a battery.

Public Participation

Prior to proposal of the standards, interested parties were advised by public notice in the **Federal Register** of a meeting of the National Air Pollution Control Techniques Advisory Committee to discuss the standards recommended for proposal. This meeting was held September 27–28, 1977. The meeting was open to the public and each attendee was given ample opportunity to comment on the standards recommended for proposal. The standards were proposed in the **Federal Register** on January 14, 1980 (45 FR 2790). Public comments were solicited at that time and, when requested, copies of the Background Information Document (BID) were distributed to interested parties. To provide interested persons the opportunity for oral presentation of data, views, or arguments concerning the proposed standards, a public hearing was held on February 13, 1980, at Research Triangle Park, North Carolina. The hearing was open to the public and each attendee was given an opportunity to comment on the proposed standards. The public comment period extended from January 14, 1980 to March 14, 1980.

Twenty-one comment letters were received on the proposed standards of performance. These comments have been carefully considered and, where determined to be appropriate by the Administrator, changes have been made in the standards which were proposed.

Significant Comments and Changes to the Proposed Regulation

Comments on the proposed standards were received from industry representatives, State air pollution control agencies, and two Federal agencies. Detailed discussion of these comments can be found in Volume II of the Background Information Document (BID). The major comments can be combined into the following areas: general, emission control technology, economic impact, legal considerations, test methods and monitoring, reporting and recordkeeping, and other considerations.

General

Facilities at any plant with a production capacity of less than 500 batteries per day (bpd) were exempted under the proposed standards. Some commenters felt that the number of batteries which can be produced at a plant was not the appropriate criterion on which to base the size cutoff. It was pointed out that lead-acid batteries are produced in a variety of sizes, and that emissions from battery production are probably related more to the amount of lead used to produce batteries than to the number of batteries produced.

These are considered to be reasonable comments. Economic impacts of standards as well as emissions are expected to be related to the amount of lead used in a particular battery production operation rather than to the number of batteries produced. At the time of proposal, it was estimated that odd-sized lead-acid batteries represented a very small share of the lead-acid battery market; however, the comments received on the proposed standards indicated that a significant number of odd-sized batteries are produced. Industrial lead-acid batteries, which can be as much as 50 times larger than automobile batteries, are estimated to represent about 7 percent of total U.S. lead-acid battery production.

Therefore, the small size cutoff for the promulgated regulation is expressed in terms of lead throughput. The promulgated standards will affect new, modified, and reconstructed facilities at any plant with the capacity to produce in one day batteries which would contain, in total, an amount of lead greater than or equal to 5.9 Mg (6.5 tons). This cutoff is equivalent to the 500 bpd cutoff for plants producing typical automobile batteries. The level is based on an average battery lead content of 11.8 kg (26 lb) of lead per battery.

One commenter questioned whether plant capacity is to be determined based

on the maximum demonstrated production rate or the estimated maximum production rate, for the purposes of the small size cutoff.

For the purposes of the small size cutoff, the parameter to be used to determine the production capacity of a plant is its design capacity. The design capacity is the maximum production capability of the plant and can be determined using the design specifications of the plant's component facililties, taking into account the facility with the smallest rated production capacity. The design capacity of a plant can be confirmed by checking production records. The figure cited as a plant's production capacity should not be less than the maximum production rate in the plant's records.

Several commenters felt that the 500 bpd cutoff should be raised to 2000 bpd. This contention was based on the fact that the Federal regulations which set minimum standards for State implementation plans (SIPs) for the lead national ambient air quality standard do not require ambient air quality monitoring or atmospheric dispersion analyses for plants smaller than 2000 bpd [40 CFR 51.80(a)(1) and 51.84(a)]. The commenters considered these cutoffs to be indicative of a decision by EPA that battery plants smaller than 2000 bpd are not material contributors to lead air pollution.

It should be noted that the Federal regulations to which the commenters referred only set minimum standards for a lead SIP. Also, as discussed in the Legal Considerations section of this preamble, the regulatory approach for NAAQS regulations promulgated under Section 109 of the Clean Air Act differs from that for standards of performance promulgated under Section 111 of the Act. The small size cutoff for the standards of performance for lead-acid battery manufacture is based on a thorough analysis of the economic impacts of these standards. The analysis indicated that the economic impact of standards on plants smaller than about 250 bpd could be severe, but showed that the economic impact would be reasonable for plants with capacities greater than or equal to 500 bpd. None of the commenters submitted information indicating that the ecomomic impact of standards might be severe for plants in the 500 to 2000 bpd size range. Therefore, although the small size cutoff is now expressed in terms of lead throughput rather than battery production, the level of the cutoff remains at the lead throughput capacity which corresponds to a production capacity of 500 bpd.

Several commenters contended that the proposal of a 0 percent opacity standard for all affected facilities was impractical. These commenters were concerned that emissions from facilities which emit fine particles would exceed 0 percent opacity. Also, some were concerned that emissions from facilities controlled by fabric filters would exceed 0 percent opacity during fabric filter cleaning. However, one commenter stated that the 0 percent opacity standard appears achievable for all affected facilities.

The 0 percent opacity standard for lead oxide manufacturing, grid casting, paste mixing, three-process operation and "other lead-emitting" facilities is considered reasonable. Lead oxide manufacturing, grid casting, paste mixing, and three-process operation facilities were observed by EPA to have emissions with 0 percent opacity for periods of 3 hours and 19 minutes, 7 hours and 16 minutes, 1 hour and 30 minutes, and 3 hours and 51 minutes, respectively. Under the promulgated standards, compliance with the opacity standard is to be determined by taking the average opacity over a 6-minute period, according to EPA Test Method 9, and rounding the average to the nearest whole percentage. The rounding procedure is specified in order to allow occasional brief emissions with opacities greater than 0 percent, which may occur during fabric filter cleaning. For grid casting, the observations were made at a facility controlled by an impingement scrubber. For lead oxide production and three-process operation facilities, the observation periods included fabric filter cleaning phases.

The opacity standard for lead reclamation has been changed to 5 percent in the promulgated standards. A standard of 0 percent opacity was originally proposed for lead reclamation, although emissions with opacities greater than 0 percent were observed from the facility tested by EPA. The 0 percent opacity standard was considered reasonable, because the facility tested by EPA was controlled by an impingement scrubber and the proposed emission limit for lead reclamation was based on transfer of fabric filtration technology. As noted in the CONTROL TECHNOLOGY discussion, the final emission limit for lead reclamation is based on the demonstrated emission reduction capabilities of the impingement scrubber on the facility tested by EPA. The final opacity standard of 5 percent is based on observations at this facility. Emissions from this facility were observed for 3 hours and 22 minutes. The highest 6-minute average opacity during the 3 hour 22 minute observation period was 4.8 percent. Therefore, the 5 percent opacity standard for lead reclamation is considered achievable.

Under the general provisions applicable to all new source performance standards, the operator of an affected facility may request the Administrator to determine the opacity of emissions from the affected facility during the initial performance test (40 CFR 60.11). If the Administrator finds that the affected facility is in compliance with the applicable standards for which performance tests are conducted, but fails to meet an applicable opacity standard, the operator of the facility may petition the Administrator to make an appropriate adjustment to the opacity standard for the facility.

Some commenters stated that EPA should establish a relationship between opacity and emissions before setting opacity standards.

Opacity limits are being promulgated in addition to mass emission limits because the Administrator believes that opacity limits provide the most effective and practical method for determining whether emission control equipment, necessary for a source to meet the mass emission limits, is continuously maintained and operated properly. It has not been the Administrator's position that a single, constantly invariant and precise correlation between opacity and mass emissions must be identified for each source under all conditions of operation. Such a correlation is unnecessary to the opacity standard, because the opacity standard is set at a level such that if the opacity standard is exceeded for a particular facility, one would expect that the applicable emission limitation will also be exceeded. Furthermore, as noted above, a mechanism is provided in the general provisions whereby the operator of a facility can request that a separate opacity standard be set for that facility if, during the initial performance test, the Administrator finds that the facility is in compliance with all other applicable standards but fails to meet the respective opacity standard.

One commenter felt that additional testing should be conducted before standards are promulgated. The commenter contended that the EPA data base is narrow, and that tests should be conducted to determine the variability of the efficiency of emission control devices.

The Administrator has determined that the data base developed by EPA provides adequate support for the

promulgated new source performance standards. The promulgated standards are based on tests of a total of eight facilities which have been determined by EPA to be well controlled and typical of facilities used in the industry. As noted by some commenters, EPA has not tested emissions from facilities producing maintenance-free or low-maintenance batteries or Barton lead oxide production facilities. Differences between such facilities and the facilities tested by EPA are discussed in detail below and in the Emission Control Technology section. These differences are not expected to have a significant effect on the controlled lead concentrations achievable using the emission control techniques tested by EPA. Commenters did not refer to nor is EPA aware of any other specific process variations which might influence emissions. The Agency has set the promulgated lead emission limits above the levels achieved in the EPA tests to allow solely for variations caused by factors that the Agency cannot identify at this time.

Some commenters stated that changes have occurred in the lead-acid battery manufacturing industry, which may influence emissions, since the EPA tests were conducted. The changes cited by the commenters were the production of maintenance-free and low-maintenance batteries, and the increasing of volumes of air ventilated from facilities in order to meet more stringent OSHA standards regulating in-plant lead levels.

The commenters briefly described the difference between maintenance-free or low-maintenance batteries and normal-maintenance batteries. The only substantial difference is that a calcium-lead alloy is used to make low-maintenance and maintenance-free batteries, while standard batteries are made using an antimonial lead alloy. This difference influences the grid casting and lead reclamation facilities, where molten lead is processed. The major change is in the makeup of the dross which must be removed from molten lead in these facilities. For grid casting, the calcium alloy also requires the use of soot as a mold release agent. For the antimonial lead alloy used in standard batteries, either soot or sodium silicate can be used.

The different makeup of dross in grid casting and lead reclamation facilities producing maintenance-free and low-maintenance batteries is not expected by EPA to cause noticeable differences in lead emissions between these facilities and facilities producing standard lead-acid batteries. The commenters did not give reasons why this difference might be expected to affect emissions and EPA is not aware of any. Dross consists of contaminants in the molten lead alloy which float to the surface and must periodically be removed. The presence of a dross layer has an impact on emissions, in that the dross layer serves to reduce fuming from the molten lead. However, this will occur regardless of the composition of the dross layer. Also, because the dross layer is made up chiefly of contaminants from the lead, the entrainment of dross particles in air exhausted from grid casting or lead reclamation facilities will not significiantly affect lead emissions. Thus, the effect of the dross layer composition on emissions is expected to be much less than the effects of process operation parameters, such as the frequency of dross removal and the temperature of the molten lead alloy.

The use of soot rather than sodium silicate as a mold release agent in grid casting will not affect uncontrolled lead emissions from this facility. However, the presence of entrained soot in uncontrolled grid casting emissions may require the use of scrubbers rather than fabric filters to control these emissions. This problem is discussed in detail in the EMISSION CONTROL TECHNOLOGY section.

The commenters stated that exhaust volumes for lead-acid battery facilities have been increased as a result of the revised OSHA standards. One commenter contended that this change will increase the concentration of uncontrolled emissions.

It is acknowledged that the exhaust volumes at the facilities tested by EPA may not have been sufficient for attainment of the 50 $\mu g/m^3$ OSHA in-plant lead concentration standard. At the time of the tests conducted by EPA the OSHA standard was 200 $\mu g/m^3$. Among the practices that plants can employ to meet the new standard are general plant maintenance, employee care, and local ventilation of in-plant lead emission sources. EPA recognizes that if ventilation rates significantly higher than those used at the facilities tested by EPA are used to meet the new OSHA standard, additional lead particles will be drawn into the exhaust streams. However, the exhaust volume increase will be greater than the lead weight increase by a margin sufficient not only to prevent an increase in the lead concentration in the exhaust, but actually to decrease that concentration. Also, the additional lead particles captured as a result of the higher exhaust volumes will consist mainly of large particles which are readily captured by control systems.

One commenter stated that there is a trend in the lead-acid battery manufacturing industry to the use of finer lead oxide in battery pastes in order to increase battery efficiency. The commenter also contended that this particle size change will influence the collection efficiency attainable with fabric filters.

Lead emissions from lead-acid battery manufacture are generated by two mechanisms. Lead oxide fumes are produced in welding, casting, and reclaiming operations, and to a certain extent in lead oxide production. Agglomerates of lead and lead oxide particles are emitted from operations involving the handling of lead oxide, lead oxide paste, and lead grids. The particles which are most difficult to capture are the fume particles. The emission rate and characteristics of the fume particles are not dependent on the size of the lead oxide particles used in battery pastes, but on the temperature of the lead during the operations from which they are emitted. For these reasons, trends in the industry to the use of smaller lead oxide particles are not expected to change the particle size distributions of emissions in such a way that collector performance will be affected.

Emission Control Technology

Some commenters thought that the proposed standards would have required the use of fabric filtration to control emissions.

The proposed standards would not have required that specific control technology be used for any affected facility, nor will the promulgated standards require specific control techniques. Rather, the standards set emissions limits which have been demonstrated to be achievable by the use of the best control systems considering costs, energy impacts, and nonair quality environmental impacts. The standards do not preclude the use of alternative control techniques, as long as the emissions limits are achieved.

The selection of fabric filtration as the best system of emission reduction for grid casting and lead reclamation facilities was criticized by a number of commenters. These facilities are normally uncontrolled or controlled by impingement scrubbers at existing plants. The commenters pointed out that only one grid casting facility in the United States is controlled by a fabric filtration system and that this system has been plagued by fires. They explained that the surfaces of exhaust ducts for grid casting and lead reclamation operations become coated

with hydrocarbons and other flammable materials. For grid casting, these include bits of cork from the molds, oils used for lubrication, and soot, which is often used as a mold release agent. For lead reclamation, hydrocarbons from plastic and other contaminants charged with lead scrap become entrained in exhaust gases and deposit on the walls of exhaust ducts. These materials are readily ignited by sparks which, the commenters contended, are unavoidable.

The commenters stated that fires started in the exhaust ducts will generally propagate to the control system. One commenter indicated that problems caused by such fires are not generally severe for scrubbers, but fires would cause serious damage and emissions excursions if fabric filters were used. The commenters stated that spark arresters would not solve the fire problem, because they too would become coated with flammable materials which would be ignited by sparks.

Apart from the problem of fires, commenters contended that contaminants present in the exhaust gases from grid casting and lead reclamation would cause frequent bag blinding if fabric filters were applied to these facilities. In addition to the materials listed above, sodium silicate, which is often used as a mold release agent for grid casting, was cited by the commenters as an extremely hygroscopic compound which would cause bag blinding. Commenters also felt that the EPA particle size and emissions test data did not support the contention made by EPA that a fabric filter could achieve 99 percent emission reduction for emissions from grid casting and lead reclamation.

The standards for grid casting and lead reclamation have been changed. Based on the information available when standards for lead-acid battery manufacture were proposed, EPA had concluded that fabric filtration could be used to control emissions from grid casting and lead reclamation, and that 99 percent collection efficiency could be attained. The proposed standards for grid casting and lead reclamation were based on tests of uncontrolled emissions from these facilities, and on fabric filter efficiencies demonstrated for the three-process operations facility and for other industries with emissions of similar character to those from lead-acid battery manufacture. The problem of bag blinding can be avoided by keeping the exhaust gases from these facilities at temperatures above their dew points. Also, it was thought that exhaust duct fires could be prevented by the use of spark arresters. In light of the point made by commenters that spark arresters would not prevent fires, EPA has concluded that the standards for grid casting and lead reclamation facilities should not be based on fabric filters.

The proposed emission limitations for grid casting and lead reclamation might be achieved using a high energy scrubber such as a venturi; however, because of the particle size of emissions from these facilities, a scrubber pressure drop of about 7.5 kPa (30 in. W.G.) would be required. The energy requirement to overcome this pressure drop is not considered reasonable for these facilities. The emissions limits for paste mixing, three-process operation, and other lead-emitting facilities are based on the application of fabric filters with average pressure drops of about 1.25 kPa (5 in. W.G.). Thus, the electricity requirement per unit volume of exhaust gas to operate venturi scrubbers for the grid casting and lead reclamation facilities would be roughly six times the electricity requirement per unit volume to control other plant exhausts. It is estimated that standards based on the application of impingement scrubbers rather than venturi scrubbers to grid casting and lead reclamation facilities will result in a 50 percent decrease in the total electricity necessary to comply with the NSPS while having only a slight effect on the emissions reduction attributable to the NSPS (from 97 percent reduction to 96.7 percent reduction from a typical new plant).

The Administrator has therefore determined that for the lead-acid battery manufacturing industry, impingement scrubbers operating at a pressure drop of about 1.25 kPa (5 in. W.G.) represent the best system of emission reduction considering costs, nonair quality health and environmental impact and energy requirements for grid casting and lead reclamation. Therefore, in the promulgated standards, the emissions limitations for grid casting and lead reclamation have been raised to levels which have been shown to be achievable in tests of impingement scrubbers controlling these facilities. This change represents a change from the regulatory alternative chosen for the proposed standards. The environmental, economic, and energy impacts of the alternative which has been chosen for the promulgated standards are discussed in both Volumes I and II of the BID.

EPA measured lead emissions from two grid casting facilities. One of these facilities was uncontrolled, and the other was controlled by an impingement scrubber. Average uncontrolled and controlled lead emissions from the scrubber controlled facility were 2.65 mg/dscm (11.6×10^{-4} gr/dscf) and 0.32 mg/dscm (1.4×10^{-4} gr/dscf), respectively. The promulgated standard for grid casting, 0.4 mg/dscm (1.76×10^{-4} gr/dscf), is based on the controlled lead emission rate for this facility. The facility is considered typical of grid casting facilities used in the lead-acid battery manufacturing industry. EPA is not aware of any process variations which would result in a significant increase in the emission concentration achievable using a scrubber control system. The Agency has set the promulgated lead emission limit above the level achieved in the EPA test to allow solely for variations caused by factors that the Agency cannot identify at this time.

Lead reclamation emissions were measured by EPA for a facility controlled by an impingement scrubber. Average lead concentrations in the inlet and outlet streams from the scrubber were 227 mg/dscm (990×10^{-4} gr/dscf) and 3.7 mg/dscm (16×10^{-4} gr/dscf). The standard for lead reclamation, 4.5 mg/dscm (19.8×10^{-4} gr/dscf), is based on the controlled emission rate measured for this facility. This facility is considered typical of lead reclamation facilities used in the lead-acid battery manufacturing industry. EPA is not aware of any process variations which would result in a significant increase in the emission concentration achievable using a scrubber control system. The Agency has set the promulgated lead emission limit above the level achieved in the EPA test to allow solely for variations caused by factors that the Agency cannot identify at this time.

Several commenters criticized the choice of fabric filtration as the best system of emission reduction for the entire paste mixing cycle. The paste mixing operation is a batch operation consisting of two phases: charging and mixing. The paste mixing facility is generally controlled by impingement scrubbing, although fabric filtration is often used to control exhaust from the charging phase. The commenters felt that if fabric filtration were to be used for the entire cycle, the moisture present in the exhaust during the mixing phase would cause bag blinding. Therefore, they requested that the emission limit for paste mixing be raised to a level achievable using impingement scrubbers.

If fabric filters are used to meet the emission limit, bag blinding can be

prevented by keeping paste mixer exhausts at temperatures above their dew points. The energy which would be required to heat the exhaust gases and the costs for providing insulation for ducts and fabric filters applied to paste mixing facilities were taken into consideration in the energy and economic analyses for the new source performance standards. These costs and energy requirements are considered reasonable. In addition, data submitted by one commenter show that the standard for paste mixing is achievable using impingement scrubbers. Tests were conducted of emissions from two scrubber controlled paste mixing facilities, using methods similar to Method 12. These tests indicated average controlled lead emissions of 0.04 mg/dscm (1.09×10^{-4} gr/dscf) and 0.07 mg/dscm (0.30×10^{-4} gr/dscf) for the two facilities. Both of these average concentrations are well below the 1 mg/dscm (4.4×10^{-4} gr/dscf) standard for paste mixing.

Some commenters contended that EPA test data did not adequately support the statement that 99 percent collection efficiency could be achieved for paste mixing emissions using fabric filter filtration. The commenters stated that fabric cleaning periods should be included in the calculation of fabric filter efficiency.

The standard for paste mixing is considered achievable. Emissions from a paste mixing facility were tested by EPA. The average uncontrolled lead concentration from this facility was 77.4 mg/dscm (338×10^{-4} gr/dscf). Thus, the promulgated regulation is expected to require about 98.7 percent control of lead emissions from paste mixing. EPA tests of a fabric filtration system controlling a three-process operation showed an average lead collection efficiency of 99.3 percent. This fabric filtration system underwent bag cleaning during testing. EPA tests and statements made by several commenters indicate that the particle size distribution for paste mixing emissions is similar to that for three-process operation emissions. Emissions from paste mixing are made up of lead oxide agglomerates, while emissions from three-process operation facilities are made up mainly of agglomerates with some other large particles and some fumes. Because of the absence of fumes in paste mixing emissions, emission reductions greater than those demonstrated for the three-process operation facility may be achievable for paste mixing facilities. The above data show that efficiencies greater than 98.7 percent can be achieved for paste mixing emissions.

In addition, EPA tests of a controlled paste mixing facility indicate that the 1 mg/dscm standard for paste mixing is achievable. As noted earlier, paste mixing is a batch process which can be divided into a charging phase and a mixing phase. Emission concentrations are highest during the charging phase. EPA conducted tests of a facility where paste mixing emissions were controlled by two separate systems. At this plant, paste mixing required a total of 21 to 24 minutes per batch. During the charging phase (the first 14 to 16 minutes of a cycle) exhaust from the paste mixer was ducted to a fabric filter which also controlled emissions from the grid slitting (separating) operation. During the mixing phase (the remainder of the cycle), paste mixer exhaust was ducted to an impingement scrubber which also controlled emissions from the grid casting operation. Uncontrolled or controlled emissions for the paste mixer alone were not tested. The average concentration of lead in emissions from the fabric filtration system used to control charging emissions was 1.3 mg/dscm (5.5×10^{-4} gr/dscf). The average lead content of exhaust from the scrubber used to control mixing emissions was 0.25 mg/dscm (1.1×10^{-4} gr/dscf). The minimum time specified in the standard for a test run, 60 minutes (§ 60.374(b)), exceeds the duration of a mixing cycle. Thus, the emission concentration used to determine compliance with the paste mixing standard would be the average of the emission concentrations from charging and mixing. The average lead concentration in controlled emissions from the facility discussed above was about 0.95 mg/dscm (4.2×10^{-4} gr/dscf) which is slightly below the proposed emission limit of 1 mg/dscm (4.4×10^{-4} gr/dscf). A lower average emission concentration could be achieved by using fabric filtration, generally a more efficient control technique than impingement scrubbing, to control emissions from all phases of paste mixing.

Also, as noted earlier, one commenter submitted data showing that the standard for paste mixing is achievable using impingement scrubbing to control emissions from the entire cycle.

Several commenters criticized the fact that the standard for lead oxide production is based on tests conducted at a ball mill lead oxide production facility, but will apply to Barton lead oxide production facilities as well as ball mill facilities. Some commenters stated that the particle size of the oxide to be collected depends on the type of lead oxide produced. One commenter stated that Barton facilities are more commonly used to produce lead oxide than ball mill facilities.

In both the ball mill process and the Barton process, all of the lead oxide product must be removed from an air stream. In the ball mill process, lead pigs or balls are tumbled in a mill, and the frictional heat generated by the tumbling action causes the formation of lead oxide. The lead oxide is removed from the mill by an air stream. In the Barton process, molten lead is atomized to form small droplets in an air stream. These droplets are then oxidized by the air around them.

EPA tests on a Barton process indicated that Barton and ball mill processes have similar air flow rates per unit production rate. Because these air streams carry all of the lead oxide produced, the concentrations of lead oxide in the two streams must also be similar. Data submitted by one commenter indicate that the percentage of fine particles in lead oxide produced by the Barton process is similar to the percentage of fine particles in lead oxide produced by the ball mill process. The similarities between the concentrations and particle size distributions of the oxide bearing air streams in the Barton and ball mill processes support EPA's contention that a similar level of emission control could be achieved for a Barton process as has been demonstrated for the ball mill process. It should be noted that the Agency has set the promulgated lead emission limit above the level achieved in the EPA test to allow solely for variations caused by factors that the Agency cannot identify at this time.

Some commenters felt that the standard for lead oxide production was too stringent. One commenter stated that the emission rate calculated for a lead-oxide production facility controlled by a cyclone and a fabric filter in series is higher than the standard for lead oxide production.

The emission limit for lead oxide production of 5 milligrams of lead per kilogram of lead processed is considered achievable. The limit is based on the results of a test of emissions from a ball mill lead oxide production facility with a fabric filter control system, which showed an average controlled emission rate of 4.2 mg/kg (8.4 lb/ton) for this facility. The comments on the lead oxide standard were based on calculation and not on emission testing. No reason was given why the calculations might be more reliable than the EPA test data or why the EPA test might not be

representative of the emission level achievable for a well controlled lead oxide production facility.

Several commenters stated that the emission limit for the three-process operation was not supported by the BID for the proposed standards. However, one commenter stated that the emission limit appears achievable.

The limit for the three-process operation is based on the results of EPA tests conducted at four plants where fabric filtration was used to control three-process operation emissions. Each of the sets of tests conducted by EPA showed average controlled lead concentrations below the promulgated limit. The limit was set above the levels shown to be achievable in the four EPA tests to allow solely for variations caused by factors that the agency cannot identify at this time. Therefore, the lead emission limit for the three-process operation facility is considered achievable.

Economic Impact

One commenter contended that new source performance standards would impose a substantial and burdensome cost on the lead-acid battery manufacturing industry. Another stated that battery sales have fallen by 25 percent in recent years.

The economic impacts of new source performance standards on the lead-acid battery manufacturing industry are analyzed and described in detail in Volumes I and II of the BID. These impacts are summarized in the section of this preamble entitled "SUMMARY OF ENVIRONMENTAL, ENERGY, AND ECONOMIC IMPACTS." The projected economic impacts are considered reasonable. The expected annualized cost of compliance with the promulgated standards at a typical affected plant is expected to be about 1.6 percent of the wholesale price of a battery; and the economic impact analysis indicates that this cost could be passed on with little effect on sales.

The promulgated standards are new source performance standards and will only affect new, modified, and reconstructed facilities. Existing facilities are not covered by the standards. The 25 percent drop in sales cited by the second commenter results from the recent decline in the production of domestic automobiles. The low sales, if they continue, would reduce growth in the production capacity of the industry. Hence, the number of new, modified, and reconstructed facilities would be reduced. Since the standards will affect only these facilities, the low sales should not increase the economic impact of the standards on the industry as a whole or on individual plants.

Several commenters contended that the cost of compliance with OSHA standards was not adequately addressed in Volume I of the BID. The commenters also felt that the OSHA standards would require higher ventilation rates than are currently needed, and would thus cause the costs of compliance with new source performance standards to be higher than the estimates made by EPA.

The OSHA compliance costs presented in Volume I are based on the capital and operating cost of controls which were expected to be required to meet the employee exposure standards of 200 $\mu g/m^3$ originally proposed by OSHA in 1975. The controls include employee care, general plant maintenance, and local ventilation of in-plant lead emission sources. On November 14, 1978, OSHA promulgated an employee exposure standard of 50 $\mu g/m^3$. However, the controls necessary to comply with this standard are expected to be similar to those which would have been necessary for the originally proposed 200 $\mu g/m^3$ standard. In addition, the economic impact projected for the OSHA standards in Volume I may be higher than the actual economic impact, because, in a number of cases, work practices may be used to achieve the OSHA standard in place of technological controls.

In volume I of the BID, the statement is made that a change in the OSHA standards could cause the control costs for the new source performance standards to increase substantially. However, in light of data obtained in recent investigations and discussed in Volume II of the BID, it is not expected that the change in OSHA standards will have a significant effect on the results of the economic impact analysis for the NSPS. The facility exhaust rates used to project the economic impacts of the NSPS were not based on the exhaust rates of facilities tested by EPA but were set at levels which would provide good ventilation for the facilities under consideration. These exhaust rates are higher than those which were used at typical lead-acid battery plants before the change in the OSHA standard, and are thought to be sufficient for compliance with the 50 $\mu g/m^3$ OSHA standard.

Environmental Impact

A number of commenters contended that, because lead-acid battery manufacturer accounts for a small percentage of total nationwide lead emissions, new source performance standards should not be set for this source category. One commenter cited data which indicate that lead emissions from lead-acid battery manufacturer accounted for only about 0.32 percent of industrial lead emissions or about 0.014 percent of total nationwide lead emissions in 1975.

It is acknowledged that lead-acid battery plants account for a relatively small share of total nationwide atmospheric lead emissions. In 1975, about 95 percent of U.S. lead emissions resulted from the production of alkyl lead gasoline additive, the burning of leaded gasoline, and the disposal of crankcase oil from vehicles which burn leaded gasoline. These emissions will be reduced substantially as the use of alkyl lead gasoline additives is curtailed. Another 1 percent of nationwide lead emissions is from mining and smelting operations, which are generally located in remote areas. However, lead-acid battery plants are generally located in urban areas, near the markets for their batteries. Ambient lead levels are already high in many of these places, often exceeding the NAAQS for lead. In light of the dangerous levels of lead in the ambient air surrounding many of the projected sites for new, modified, and reconstructed facilities, the Agency believes that additional emissions from lead-acid battery manufacture are significant. As a result, lead emissions from aggregated lead-acid battery manufacture, though smaller than emissions from some of the other sources, do contribute significantly to air pollution which may reasonably be anticipated to endanger public health or welfare. Therefore, the Administrator considers the development of new source performance standards for this industry to be justified.

Several commenters recommended that the grid casting facility be removed from the list of affected facilities. According to EPA estimates, grid casting accounts for about 3.2 percent of overall uncontrolled battery plant lead emissions. The commenters stated that it is unreasonable to require sources to control facilities generating such a small percentage of total plant emissions.

Lead-acid battery plants are major lead emitters, and EPA dispersion calculations show that the ambient lead standard could be exceeded in the area around a plant which controls emissions to the extent required to meet typical SIP particulate regulations. Grid casting, while accounting for only about 5 percent of emissions for a plant with such controls, can be controlled with lead reclamation by available technology at a cost which is similar to the cost of controlling larger sources in

the plant. Of the 30¢ per battery cost impact of the standards for a typical plant, approximately 4¢ per battery can be attributed to grid casting control. Therefore, grid casting emissions are regulated under the promulgated standards.

Legal Considerations

Several commenters stated that, because a national ambient air quality standard for lead has been established, new source performance standards regulating lead emissions would be redundant and unnecessary.

It should be noted that the purposes of standards of performance for new sources promulgated under Section 111 of the Clean Air Act differ from the purposes of national ambient air quality standards, which are promulgated under Section 109 of the Act. National ambient air quality standards establish ambient pollutant concentration target ceilings which are to be attained and maintained for the protection of the public health or welfare.

New source performance standards promulgated under Section 111 of the Clean Air Act are not designed to achieve any specific air quality levels. Congress clearly intended that new source performance standards regulate Section 108 pollutants in addition to other air pollutants, since a key purpose of Section 111 is to establish nationally applicable emission limits for new sources, thus preventing any state from attracting industry by adopting lenient environmental standards. Congress expressed a number of other reasons for requiring the setting of new source performance standards. Because the national ambient air quality standards create air quality ceilings which are not to be exceeded, new source performance standards enhance the potential for long term growth. Also, new source performance standards may help achieve long-term cost savings by avoiding the need for expensive retrofitting when pollution ceilings may be reduced in the future. Finally, the standard-setting process should create incentives for improved technology. Therefore, because the purposes of ambient air quality standards are different from the purposes of new source performance standards, promulgation of an NSPS to control emissions from lead-acid battery plants of a pollutant for which there exists an NAAQS is neither redundant nor unnecessary.

Test Methods and Monitoring

Reference Method 12—A number of commenters felt that Reference Method 12 was cumbersome and recommended the development of a simpler screening method. The commenters stated that a battery plant may have as many as two dozen stacks and that, at an average cost of $6000 per stack test, the cost of testing an entire plant could be extremely high.

Because controlled emission levels for most facilities are expected to be near the emission limits for facilities affected by the regulation, a screening method less accurate than Method 12 would generally not be suitable for determining compliance with the lead-acid battery manufacture regulation. The cost of compliance testing using Method 12 was discussed in the BID for the proposed standards and is considered reasonable. For plants where a number of stacks must be tested, the per plant costs of conducting performance tests using Method 12 are not expected to be as high as the commenters anticipated. Although existing plants often have a large number of stacks, it is expected that for newly constructed, modified, or reconstructed plants or facilities emissions will be ducted to a small number of stacks. The estimate of $6,000 per stack for a compliance test applies only for plants where a small number of stacks are to be tested. For plants with a large number of stacks, the cost per stack could decrease significantly. In addition, the general provisions applicable to all new source performance standards allow for the use of an alternative method where the Administrator determines that the results would be adequate for indicating whether a specific source is in compliance [40 CFR 60.8(b)].

One commenter recommended that the minimum sampling time for Method 12 be extended. Another stated that the minimum sampling time for grid casting in the proposed regulation was too long.

For tests with Method 12, the mimimum amount of lead needed for good sample recovery and analysis is 100 μg. The mimimum sampling rates and times insure that enough lead will be collected. For grid casting, the minimum sampling time has been changed from 180 minutes, in the proposed regulation, to 60 minutes, in the promulgated action. The change reflects the alteration in the standard for grid casting.

Reference Method 9—Two commenters expressed concern that Method 9 is not accurate enough to be used to enforce a standard of 0 percent opacity. One commenter stated that it is difficult to discern the difference between 0 percent opacity and 1 percent opacity for a given reading.

No single reading is made to the nearest percent; rather, readings are to be recorded to the nearest 5 percent opacity and averaged over a period of 6 minutes (24 readings). For this regulation, the 6-minute average opacity figure is to be rounded to the nearest whole number. The opacity standard for lead-acid battery manufacture is based on opacity data taken for operating facilities.

Reporting and Recordkeeping

A number of commenters contended that the proposed pressure drop monitoring and recording requirement for control systems would not serve to insure proper operation and maintenance of fabric filters. The commenters pointed out that a leak in a fabric filter would not result in a measurable difference in the pressure drop across the filter. One commenter suggested that the pressure drop monitoring requirement be replaced by an opacity monitoring requirement. Another commenter suggested that the pressure drop requirement be replaced by a requirement of visible inspection of bags for leaks.

Based on the arguments presented by these commenters, it is agreed that proposed pressure monitoring requirement for fabric filters would not serve its intended purpose. This requirement has been eliminated. However, pressure drop is considered to be a good indicator of proper operation and maintenance for scrubbers. Therefore the pressure drop monitoring and recording requirement for scrubbers has been retained.

The pressure drop monitoring requirement for fabric filters has not been replaced by another monitoring requirement. The cost of opacity monitoring equipment may in some cases be comparable to the cost of emission control systems for lead-acid battery manufacturing facilities. This cost is considered unreasonable. Although periodic visual inspection of bags would provide an indication of bag integrity, visual inspection records would not be useful to the EPA in the enforcement of the promulgated standards.

A number of commenters stated that while pressure drop monitoring is useful for scrubbers, continuous recording of pressure drop would be unnecessary and expensive. Some commenters questioned whether a device which cyclically monitors the pressure drop across several emission control systems would be considered a continuous recorder for the systems. These commenters also asked how often such a recorder would have to monitor the pressure drop across a particular control

device to be considered a continuous recorder for that device. One commenter suggested the substitution of periodic manual recording of pressure drop for the continuous pressure drop recording requirement. Another commenter questioned the purpose of requiring pressure drop monitoring and recording without a requirement that action be taken at certain pressure drop levels.

The purpose of pressure drop recording requirements is to allow the verification by EPA that emission control systems are properly operated and maintained. The costs of pressure drop recording devices were analyzed and are considered reasonable. The sort of device that would satisfy the recording requirement has been clarified in the promulgated standards. It has been determined that for the purposes of these standards a device which records pressure drop at least every 15 minutes would accomplish the same purposes as a continuous pressure drop recorder. Manual pressure drop recording would not insure proper operation and maintenance of a control system.

Other Considerations

A number of commenters recommended that the definition of the paste mixing facility be expanded to include operations ancillary to paste mixing, such as lead oxide storage, conveying, weighing, and metering operations; paste handling and cooling operations; and plate pasting, takeoff, cooling, and drying operations. The commenters stated that paste mixing and operations ancillary to the paste mixing operation are generally interdependent, in that one operation is not run without the others. Also, emissions from paste mixing and ancillary operations are often ducted to the same control device. The commenters were concerned that a minor change made to a paste mixing machine could cause the machine to be affected by the promulgated standards under the reconstruction provisions applicable to all new source performance standards. They stated that the recommended change would avoid this possibility.

These comments are considered reasonable. The operations ancillary to paste mixing were not intended to be considered separate facilities; and the definition recommended by the commenters for the paste mixing facility is considered an appropriate definition. Therefore, the recommendation of the commenters has been adopted in the promulgated regulation. Because the emission limit which was proposed for paste mixing is identical to that which was proposed for operations ancillary to paste mixing ("other lead-emitting operations"), this change is not expected to affect the environmental impacts of the standards.

Docket

The docket is an organized and complete file of all the information considered by EPA in the development of this rulemaking. The docket is a dynamic file, since material is added throughout the rulemaking development. The docketing system is intended to allow members of the public and industries involved to readily identify and locate documents so that they can intelligently and effectively participate in the rulemaking process. Along with the statement of basis and purpose of the promulgated standards and EPA responses to significant comments, the contents of the docket will serve as the record in case of judicial review (Section 307(d)(7)(A)).

Miscellaneous

The effective date of this regulation is April 16, 1982. Section 111 of the Clean Air Act provides that standards of performance or revisions thereof become effective upon promulgation and apply to affected facilities, construction or modification of which was commenced after the date of proposal (January 14, 1980).

As prescribed by Section 111, the promulgation of these standards was preceded by the Administrator's determination (40 CFR 60.16, 44 FR 49222, August 21, 1979) that these sources contribute significantly to air pollution which may reasonably be anticipated to endanger public health or welfare and by proposal of the standards on January 14, 1980 (45 FR 2790). In accordance with Section 117 of the Act, publication of these promulgated standards was preceded by consultation with appropriate advisory committees, independent experts, and Federal departments and agencies.

It should be noted that standards of performance for new sources established under Section 111 of the Clean Air Act reflect:

> * * * application of the best technological system of continuous emission reduction which (taking into consideration the cost of achieving such emission reduction, any nonair quality health and environmental impact and energy requirements) the Administrator determines has been adequately demonstrated (Section 111(a)(1)).

Although there may be emission control technology available that can reduce emissions below those levels required to comply with standards of performance, this technology might not be selected as the basis of standards of performance because of costs associated with its use. Accordingly, standards of performance should not be viewed as the ultimate in achievable emission control. In fact, the Act requires (or has the potential for requiring) the imposition of a more stringent emission standard in several situations.

For example, applicable costs do not necessarily play as prominent a role in determining the "lowest achievable emissions rate" for new or modified sources located in nonattainment areas, i.e., those areas where statutorily mandated health and welfare standards are being violated. In this respect, Section 173 of the Act requires that a new or modified source constructed in an area which exceeds the National Ambient Air Quality Standard (NAAQS) must reduce emissions to the level which reflects the "lowest achievable emission rate" (LAER), as defined in Section 171(3), for such category of source. The statute defines LAER as that rate of emission which reflects:

> (A) The most stringent emission limitation which is contained in the implementation plan of any State for such class or category of source, unless the owner or operator of the proposed source demonstrates that such limitations are not achievable, or
>
> (B) The most stringent emission limitation which is achieved in practice by such class or category of source, whichever is more stringent.

In no event can the emission rate exceed any applicable new source performance standard (Sec. 171(3)).

A similar situation may arise under the prevention of significant deterioration of air quality provisions of the Act (Part C). These provisions require that certain sources (referred to in Section 169(1)) employ "best available control technology" (as defined in Section 169(3)) for all pollutants regulated under the Act. Best available control technology (BACT) must be determined on a case-by-case basis, taking energy, environmental and economic impacts, and other costs into account. In no event may the application of BACT result in emissions of any pollutants which will exceed the emissions allowed by any applicable standard established pursuant to Section 111 (or 112) of the Act.

In any event, State implementation plans (SIPs) approved or promulgated under Section 110 of the Act must provide for the attainment and maintenance of National Ambient Air Quality Standards designed to protect public health and welfare. For this purpose, SIPs must in some cases require greater emission reductions than

those required by standards of performance for new sources.

Finally, States are free under Section 116 of the Act to establish even more stringent emission limits than those established under Section 111 or those necessary to attain or maintain the NAAQS under Section 110. Accordingly, new sources may in some cases be subject to limitations more stringent than EPA's standards of performance under Section 111, and prospective owners and operators of new sources should be aware of this possibility in planning for such facilities.

This regulation will be reviewed 4 years from the date of promulgation as required by the Clean Air Act. This review will include an assessment of such factors as the need for integration with other programs, the existence of alternative methods, enforceability, improvements in emission control technology, and reporting requirements. The reporting requirements in the regulation will be reviewed as required under EPA's sunset policy for reporting requirements in regulations.

Under Executive Order 12291, EPA must judge whether a regulation is "Major" and therefore subject to the requirement of a Regulatory Impact Analysis. This regulation is not Major because: (1) The national annualized compliance costs, including capital charges resulting from the standards total less than $100 million; (2) the standards do not cause a major increase in prices or production costs; and (3) the standards do not cause significant adverse effects on domestic competition, employment, investment, productivity, innovation or competition in foreign markets. This regulation was submitted to the Office of Management and Budget (OMB) for review as required by Executive Order 12291.

Section 317 of the Clean Air Act requires the Administrator to prepare an economic impact assessment for any new source standard of performance promulgated under Section 111(b) of the Act. An economic impact assessment was prepared for the promulgated regulations and for other regulatory alternatives. All aspects of the assessment were considered in the formulation of the promulgated standards to insure that the standards would represent the best system of emission reduction considering costs. The economic impact assessment is included in the background information document.

List of Subjects in 40 CFR Part 60

Air pollution control, Aluminum, Ammonium sulfate plants, Cement industry, Coal, Copper, Electric power-plants, Glass and glass products, Grains, Intergovernmental relations, Iron, Lead, Metals, Motor vehicles, Nitric acid plants, Paper and paper products industry, Petroleum, Phosphate, Sewage disposal, Steel, Sulfuric acid plants, Waste treatment and disposal, Zinc.

Dated: April 9, 1982.

Note.—The regulation does not involve a "collection of information" as defined under the Paperwork Reduction Act of 1980. Therefore, the provisions of the Paperwork Reduction Act applicable to collections of information do not apply to this regulation.

Anne M. Gorsuch,

Administrator.

PART 60—STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES

40 CFR Part 60 is amended by adding a new Subpart KK and by adding a new reference method to Appendix A as follows:

1. A new subpart is added as follows:

Subpart KK—Standards of Performance for Lead-Acid Battery Manufacturing Plants

Sec.

Authority: Sec. 111, 301(a) of the Clean Air Act as amended (42 U.S.C. 7411, 7601(a)), and additional authority as noted below.

Subpart KK—Standards of Performance for Lead-Acid Battery Manufacturing Plants

§ 60.370 Applicability and designation of affected facility.

(a) The provisions of this subpart are applicable to the affected facilities listed in paragraph (b) of this section at any lead-acid battery manufacturing plant that produces or has the design capacity to produce in one day (24 hours) batteries containing an amount of lead equal to or greater than 5.9 Mg (6.5 tons).

(b) The provisions of this subpart are applicable to the following affected facilities used in the manufacture of lead-acid storage batteries:

(1) Grid casting facility.

(2) Paste mixing facility.

(3) Three-process operation facility.

(4) Lead oxide manufacturing facility.

(5) Lead reclamation facility.

(6) Other lead-emitting operations.

(c) Any facility under paragraph (b) of this section the construction or modification of which is commenced after January 14, 1980, is subject to the requirements of this subpart.

§ 60.371 Definitions.

As used in this subpart, all terms not defined herein shall have the meaning given them in the Act and in Subpart A of this part.

(a) "Grid casting facility" means the facility which includes all lead melting pots and machines used for casting the grid used in battery manufacturing.

(b) "Lead-acid battery manufacturing plant" means any plant that produces a storage battery using lead and lead compounds for the plates and sulfuric acid for the electrolyte.

(c) "Lead oxide manufacturing facility" means a facility that produces lead oxide from lead, including product recovery.

(d) "Lead reclamation facility" means the facility that remelts lead scrap and casts it into lead ingots for use in the battery manufacturing process, and which is not a furnace affected under Subpart L of this part.

(e) "Other lead-emitting operation" means any lead-acid battery manufacturing plant operation from which lead emissions are collected and ducted to the atmosphere and which is not part of a grid casting, lead oxide manufacturing, lead reclamation, paste mixing, or three-process operation facility, or a furnace affected under Subpart L of this part.

(f) "Paste mixing facility" means the facility including lead oxide storage, conveying, weighing, metering, and charging operations; paste blending, handling, and cooling operations; and plate pasting, takeoff, cooling, and drying operations.

(g) "Three-process operation facility" means the facility including those processes involved with plate stacking, burning or strap casting, and assembly of elements into the battery case.

§ 60.372 Standards for lead.

(a) On and after the date on which the performance test required to be conducted by § 60.8 is completed, no owner or operator subject to the provisions of this subpart shall cause to be discharged into the atmosphere:

(1) From any grid casting facility any gases that contain lead in excess of 0.40 milligram of lead per dry standard cubic meter of exhaust (0.000176 gr/dscf).

(2) From any paste mixing facility any gases that contain in excess of 1.00 milligram of lead per dry standard cubic meter of exhaust (0.00044 gr/dscf).

(3) From any three-process operation facility any gases that contain in excess of 1.00 milligram of lead per dry

standard cubic meter of exhaust (0.00044 gr/dscf).

(4) From any lead oxide manufacturing facility any gases that contain in excess of 5.0 milligrams of lead per kilogram of lead feed (0.010 lb/ton).

(5) From any lead reclamation facility any gases that contain in excess of 4.50 milligrams of lead per dry standard cubic meter of exhaust (0.00198 gr/dscf).

(6) From any other lead-emitting operation any gases that contain in excess of 1.00 milligram per dry standard cubic meter of exhaust (0.00044 gr/dscf).

(7) From any affected facility other than a lead reclamation facility any gases with greater than 0 percent opacity (measured according to Method 9 and rounded to the nearest whole percentage).

(8) From any lead reclamation facility any gases with greater than 5 percent opacity (measured according to Method 9 and rounded to the nearest whole percentage).

(b) When two or more facilities at the same plant (except the lead oxide manufacturing facility) are ducted to a common control device, an equivalent standard for the total exhaust from the commonly controlled facilities shall be determined as follows:

$$S_e = \sum_{a=1}^{N} S_a(Q_{sd_a}/Q_{sd_T})$$

Where:

S_e = is the equivalent standard for the total exhaust stream.

S_a = is the actual standard for each exhaust stream ducted to the control device.

N = is the total number of exhaust streams ducted to the control device.

Q_{sd_a} = is the dry standard volumetric flow rate of the effluent gas stream from each facility ducted to the control device.

Q_{sd_T} = is the total dry standard volumetric flow rate of all effluent gas streams ducted to the control device.

§ 60.373 Monitoring of emissions and operations.

The owner or operator of any lead-acid battery manufacturing facility subject to the provisions of this subpart and controlled by a scrubbing system(s) shall install, calibrate, maintain, and operate a monitoring device(s) that measures and records the pressure drop across the scrubbing system(s) at least once every 15 minutes. The monitoring device shall have an accuracy of ±5 percent over its operating range.

(Sec. 114 of the Clean Air Act as amended (42 U.S.C. 7414))

§ 60.374 Test methods and procedures.

(a) Reference methods in Appendix A of this part, except as provided under § 60.8(b), shall be used to determine compliance according to § 60.8 as follows:

(1) Method 12 for the measurement of lead concentrations,

(2) Method 1 for sample and velocity traverses,

(3) Method 2 for velocity and volumetric flow rate, and

(4) Method 4 for stack gas moisture.

(b) For Method 12, the sampling time for each run shall be at least 60 minutes and the sampling rate shall be at least 0.85 dscm/h (0.53 dscf/min), except that shorter sampling times, when necessitated by process variables or other factors, may be approved by the Administrator.

(c) When different operations in a three-process operation facility are ducted to separate control devices, the lead emission concentration from the facility shall be determined using the equation:

$$C_{PbT} = \sum_{a=1}^{N} (C_{Pb_a} Q_{sd_a}/Q_{sd_T})$$

Where:

C_{Pb_T} = is the facility emission concentration for the entire facility.

N = is the number of control devices to which separate operations in the facility are ducted.

C_{Pb_a} = is the emission concentration from each control device.

Q_{sd_a} = is the dry standards volumetric flow rate of the effluent gas stream from each control device.

Q_{sd_t} = is the total dry standard volumetric flow rate from all of the control devices.

(d) For lead oxide manufacturing facilities, the average lead feed rate to a facility, expressed in kilograms per hour, shall be determined for each test run as follows:

(1) Calculate the total amount of lead charged to the facility during the run by multiplying the number of lead pigs (ingots) charged during the run by the average mass of a pig in kilograms or by another suitable method.

(2) Divide the total amount of lead charged to the facility during the run by the duration of the run in hours.

(e) Lead emissions from lead oxide manufacturing facilities, expressed in milligrams per kilogram of lead charged, shall be determined using the following equation:

$$E_{Pb} = C_{Pb} Q_{sd}/F$$

Where:

E_{Pb} = is the lead emission rate from the facility in milligrams per kilogram of lead charged.

C_{Pb} = is the concentration of lead in the exhaust stream in milligrams per dry standard cubic meter as determined according to paragraph (a)(1) of this section.

Q_{sd} = is the dry standard volumetric flow rate in dry standard cubic meters per hour as determined according to paragraph (a)(3) of this section.

F = is the lead feed rate to the facility in kilograms per hour as determined according to paragraph (d) of this section.

(Sec. 114 of the Clean Air Act as amended (42 U.S.C. 7414))

2. Appendix A to Part 60 is amended by adding new Reference Method 12 as follows:

Appendix A—Reference Methods

* * * * *

Method 12. Determination of Inorganic Lead Emissions From Stationary Sources

1. *Applicability and Principle.*

1.1 Applicability. This method applies to the determination of inorganic lead (Pb) emissions from specified stationary sources only.

1.2 Principle. Particulate and gaseous Pb emissions are withdrawn isokinetically from the source and collected on a filter and in dilute nitric acid. The collected samples are digested in acid solution and analyzed by atomic absorption spectrometry using an air acetylene flame.

2. *Range, Sensitivity, Precision, and Interferences.*

2.1 Range. For a minimum analytical accuracy of ±10 percent, the lower limit of the range is 100 μg. The upper limit can be considerably extended by dilution.

2.2 Analytical Sensitivity. Typical sensitivities for a 1-percent change in absorption (0.0044 absorbance units) are 0.2 and 0.5 μg Pb/ml for the 217.0 and 283.3 nm lines, respectively.

2.3 Precision. The within-laboratory precision, as measured by the coefficient of variation ranges from 0.2 to 9.5 percent relative to a run-mean concentration. These values were based on tests conducted at a gray iron foundry, a lead storage battery manufacturing plant, a secondary lead smelter, and a lead recovery furnace of an alkyl lead manufacturing plant. The concentrations encountered during these tests ranged from 0.61 to 123.3 mg Pb/m³.

2.4 Interferences. Sample matrix effects may interfere with the analysis for Pb by flame atomic absorption. If this interference is suspected, the analyst may confirm the presence of these matrix effects and frequently eliminate the interference by using the Method of Standard Additions.

High concentrations of copper may interfere with the analysis of Pb at 217.0 nm. This interference can be avoided by analyzing the samples at 283.3 nm.

3. *Apparatus.*

3.1 Sampling Train. A schematic of the sampling train is shown in Figure 12–1; it is similar to the Method 5 train. The sampling train consists of the following components:

3.1.1 Probe Nozzle, Probe Liner, Pitot Tube, Differential Pressure Gauge, Filter Holder, Filter Heating System, Metering System, Barometer, and Gas Density Determination Equipment. Same as Method 5, Sections 2.1.1 to 2.1.6 and 2.1.8 to 2.1.10, respectively.

3.1.2 Impingers. Four impingers connected in series with leak-free ground glass fittings or any similar leak-free noncontaminating fittings. For the first, third, and fourth impingers, use the Greenburg-Smith design, modified by replacing the tip with a 1.3 cm (½ in.) ID glass tube extending to about 1.3 cm (½ in.) from the bottom of the flask. For the second impinger, use the Greenburg-Smith design with the standard tip. Place a thermometer, capable of measuring temperature to within 1°C (2°F) at the outlet of the fourth impinger for monitoring purposes.

BILLING CODE 6560-50-M

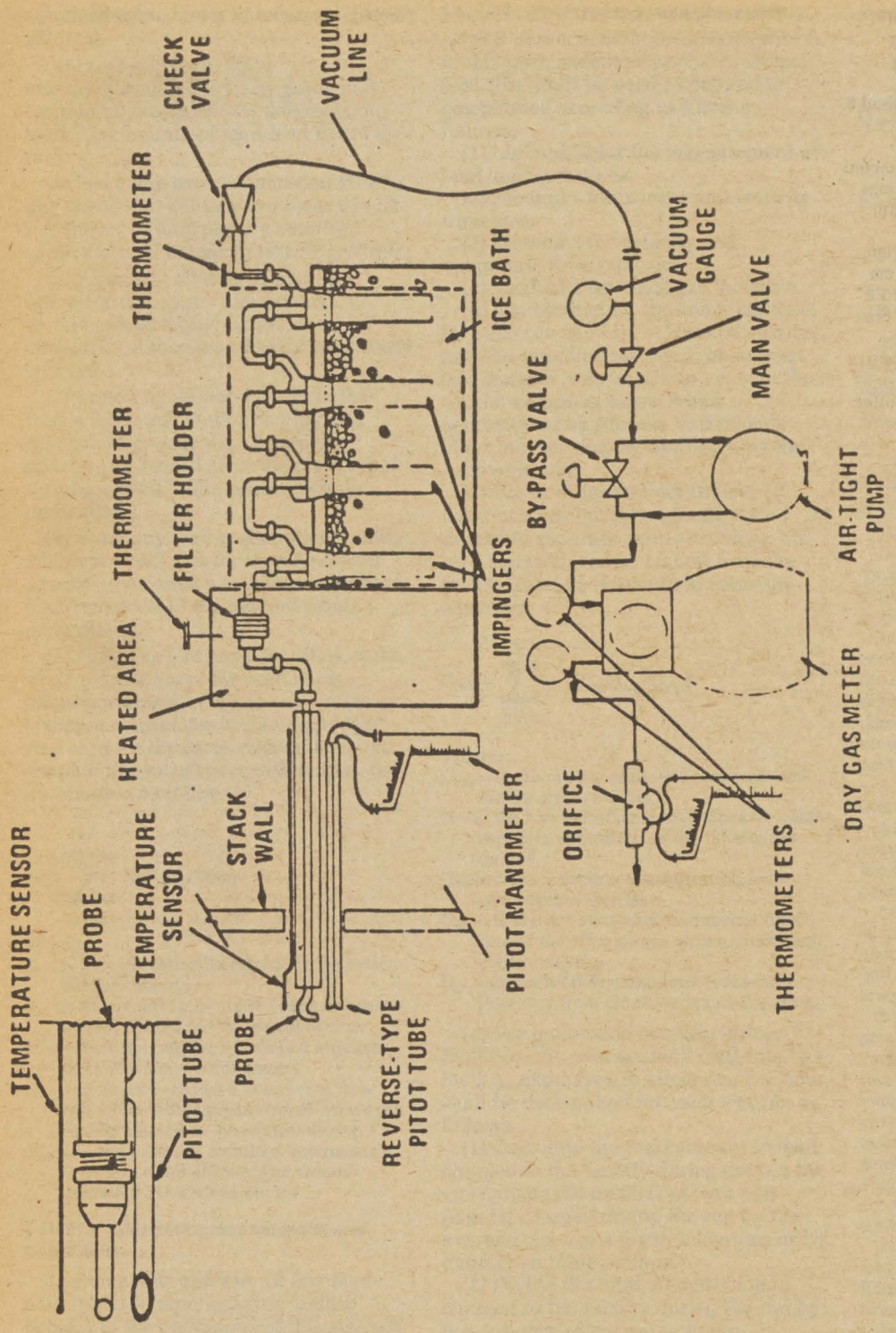

Figure 12-1. Inorganic lead sampling train.

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3.2 Sample Recovery. The following items are needed:

3.2.1 Probe-Liner and Probe-Nozzle Brushes, Petri Dishes, Plastic Storage Containers, and Funnel and Rubber Policeman. Same as Method 5, Sections 2.2.1, 2.2.4, 2.2.6, and 2.2.7, respectively.

3.2.2 Wash Bottles. Glass (2).

3.2.3 Sample Storage Containers. Chemically resistant, borosilicate glass bottles, for 0.1 nitric acid (HNO_3) impinger and probe solutions and washes, 1000-ml. Use screw-cap liners that are either rubber-backed Teflon* or leak-free and resistant to chemical attack by 0.1 N HNO_3. (Narrow mouth glass bottles have been found to be less prone to leakage.)

3.2.4 Graduated Cylinder and/or Balance. To measure condensed water to within 2 ml or 1 g. Use a graduated cylinder that has a minimum capacity of 500 ml, and subdivisions no greater than 5 ml. (Most laboratory balances are capable of weighing to the nearest 0.5 g or less.)

3.2.5 Funnel. Glass, to aid in sample recovery.

3.3 Analysis. The following equipment is needed:

3.3.1 Atomic Absorption Spectrophotometer. With lead hollow cathode lamp and burner for air/acetylene flame.

3.3.2 Hot Plate.

3.3.3 Erlenmeyer Flasks. 125-ml, 24/40 $.

3.3.4 Membrane Filters. Millipore SCWPO 4700 or equivalent.

3.3.5 Filtration Apparatus. Millipore vacuum filtration unit, or equivalent, for use with the above membrane filter.

3.3.6 Volumetric Flasks. 100-ml, 250-ml, and 1000-ml.

4. *Reagents.*

4.1 Sampling. The reagents used in sampling are as follows:

4.1.1 Filter. Gelman Spectro Grade, Reeve Angel 934 AH, MSA 1106 BH, all with lot assay for Pb, or other high-purity glass fiber filters, without organic binder, exhibiting at least 99.95 percent efficiency (<0.05 percent penetration) on 0.3 micron dioctyl phthalate smoke particles. Conduct the filter efficiency test using ASTM Standard Method D 2986–71 or use test data from the supplier's quality control program.

4.1.2 Silica Gel, Crushed Ice, and Stopcock Grease. Same as Method 5, Section 3.1.2, 3.1.4, and 3.1.5, respectively.

4.1.3 Water. Deionized distilled, to conform to ASTM Specification D 1193–74, Type 3. If high concentrations of organic matter are not expected to be present, the analyst may delete the potassium permanganate test for oxidizable organic matter.

4.1.4 Nitric Acid, 0.1 N. Dilute 6.5 ml of concentrated HNO_3 to 1 liter with deionized distilled water. (It may be desirable to run blanks before field use to eliminate a high blank on test samples.)

4.2 Pretest Preparation. 6 N HNO_3 is needed. Dilute 390 ml of concentrated HNO_3 to 1 liter with deionized distilled water.

*Mention of trade names or specific products does not constitute endorsement by the U.S. Environmental Protection Agency.

4.3 Sample Recovery. 0.1 N HNO_3 (same as 4.1.4 above) is needed for sample recovery.

4.4 Analysis. The following reagents are needed for analysis (use ACS reagent grade chemicals or equivalent, unless otherwise specified):

4.4.1 Water. Same as 4.1.3 above.

4.4.2 Nitric Acid. Concentrated.

4.4.3 Nitric Acid, 50 percent (V/V). Dilute 500 ml of concentrated HNO_3 to 1 liter with deionized distilled water.

4.4.4 Stock Lead Standard Solution, 1000 μg Pb/ml. Dissolve 0.1598 g of lead nitrate [$Pb(NO_3)_2$] in about 60 ml of deionized distilled water, add 2 ml concentrated HNO_3, and dilute to 100 ml with deionized distilled water.

4.4.5 Working Lead Standards. Pipet 0.0, 1.0, 2.0, 3.0, 4.0, and 5.0 ml of the stock lead standard solution (4.4.4) into 250-ml volumetric flasks. Add 5 ml of concentrated HNO_3 to each flask and dilute to volume with deionized distilled water. These working standards contain 0.0, 4.0, 8.0, 12.0, 16.0, and 20.0 μg Pb/ml, respectively. Prepare, as needed, additional standards at other concentrations in a similar manner.

4.4.6 Air. Suitable quality for atomic absorption analysis.

4.4.7 Acetylene. Suitable quality for atomic absorption analysis.

4.4.8 Hydrogen Peroxide, 3 percent (V/V). Dilute 10 ml of 30 percent H_2O_2 to 100 ml with deionized distilled water.

5. *Procedure.*

5.1 Sampling. The complexity of this method is such that, in order to obtain reliable results, testers should be trained and experienced with the test procedures.

5.1.1 Pretest Preparation. Follow the same general procedure given in Method 5, Section 4.1.1, except the filter need not be weighed.

5.1.2 Preliminary Determinations. Follow the same general procedure given in Method 5, Section 4.1.2.

5.1.3 Preparation of Collection Train. Follow the same general procedure given in Method 5, Section 4.1.3, except place 100 ml of 0.1 HNO_3 in each of the first two impingers, leave the third impinger empty, and transfer approximately 200 to 300 g of preweighed silica gel from its container to the fourth impinger. Set up the train as shown in Figure 12–1.

5.1.4 Leak-Check Procedures. Follow the general leak-check procedures given in Method 5, Sections 4.1.4.1. (Pretest Leak-Check), 4.1.4.2 (Leak-Checks During the Sample Run), and 4.1.4.3 (Post-Test Leak-Check).

5.1.5 Sampling Train Operation. Follow the same general procedure given in Method 5, Section 4.1.5. For each run, record the data required on a data sheet such as the one shown in EPA Method 5, Figure 5–2.

5.1.6 Calculation of Percent Isokinetic. Same as Method 5, Section 4.1.6.

5.2 *Sample Recovery.* Begin proper cleanup procedure as soon as the probe is removed from the stack at the end of the sampling period.

Allow the probe to cool. When it can be safely handled, wipe off all external particulate matter near the tip of the probe nozzle and place a cap over it. Do not cap off the probe tip tightly while the sampling train is cooling down as this would create a vacuum in the filter holder, thus drawing liquid from the impingers into the filter.

Before moving the sampling train to the cleanup site, remove the probe from the sapling train, wipe off the silicone grease, and cap the open outlet of the probe. Be careful not to lose any condensate that might be present. Wipe off the silicone grease from the glassware inlet where the probe was fastened and cap the inlet. Remove the umbilical cord from the last impinger and cap the impinger. The tester may use ground-glass stoppers, plastic caps, or serum caps to close these openings.

Transfer the probe and filter-impinger assembly to a cleanup area, which is clean and protected from the wind so that the chances of contaminating or losing the sample are minimized.

Inspect the train prior to and during disassembly and note any abnormal conditions. Treat the samples as follows:

5.2.1 *Container No. 1* (Filter). Carefully remove the filter from the filter holder and place it in its identified petri dish container. If it is necessary to fold the filter, do so such that the sample-exposed side is inside the fold. Carefully transfer to the petri dish any visible sample matter and/or filter fibers that adhere to the filter holder gasket by using a dry Nylon bristle brush and/or a sharp-edged blade. Seal the container.

5.2.2 *Container No. 2* (Probe). Taking care that dust on the outside of the probe or other exterior surfaces does not get into the sample, quantitatively recover sample matter or any condensate from the probe nozzle, probe fitting, probe liner, and front half of the filter holder by washing these components with 0.1 N HNO_3 and placing the wash into a glass sample storage container. Measure and record (to the nearest 2-ml) the total amount of 0.1 N HNO_3 used for each rinse. Perform the 0.1 N HNO^3 rinses as follows:

Carefully remove the probe nozzle and rinse the inside surfaces with 0.1 N HNO^3 from a wash bottle while brushing with a stainless steel, Nylon-bristle brush. Brush until the 0.1 N HNO_3 rinse shows no visible particles, then make a final rinse of the inside surface.

Brush and rinse with 0.1 N HNO_3 the inside parts of the Swagelok fitting in a similar way until no visible particles remain.

Rinse the probe liner with 0.1 N HNO_3. While rotating the probe so that all inside surfaces will be rinsed with 0.1 N HNO_3, tilt the probe and squirt 0.1 N HNO_3 into its upper end. Let the 0.1 N HNO_3 drain from the lower end into the sample container. The tester may use a glass funnel to aid in transferring liquid washes to the container. Follow the rinse with a probe brush. Hold the probe in an inclined position, squirt 0.1 N HNO_3 into the upper end of the probe as the probe brush is being pushed with a twisting action through the probe; hold the sample container underneath the lower end of the probe and catch any 0.1 N HNO_3 and sample matter that is brushed from the probe. Run the brush through the probe three times or more until no visible sample matter is carried out with the 0.1 N HNO_3 and none remains on the probe liner on visual inspection. With

stainless steel or other metal probes, run the brush through in the above prescribed manner at least six times, since metal probes have small crevices in which sample matter can be entrapped. Rinse the brush with 0.1 N HNO_3 and quantitatively collect these washings in the sample container. After the brushing make a final rinse of the probe as described above.

It is recommended that two people clean the probe to minimize loss of sample. Between sampling runs, keep brushes clean and protected from contamination.

After insuring that all joints are wiped clean of silicone grease, brush and rinse with 0.1 N HNO_3 the inside of the front half of the filter holder. Brush and rinse each suface three times or more, if needed, to remove visible sample matter. Make a final rinse of the brush and filter holder. After all 0.1 N HNO_3 washings and sample matter are collected in the sample container, tighten the lid on the sample container so that the fluid will not leak out when it is shipped to the laboratory. Mark the height of the fluid level to determine whether leakage occurs during transport. Label the container to clearly identify its contents.

5.2.3 *Container No. 3* (Silica Gel). Check the color of the indicating silica gel to determine if it has been completely spent and make a notation of its condition. Transfer the silica gel from the fourth impinger to the original container and seal. The tester may use a funnel to pour the silica gel and a rubber policeman to remove the silica gel from the impinger. It is not necessary to remove the small amount of particles that may adhere to the walls and are difficult to remove. Since the gain in weight is to be used for moisture calculations, do not use any water or other liquids to transfer the silica gel. If a balance is available in the field, the tester may follow procedure for Container No. 3 under Section 5.4 (Analysis).

5.2.4 *Container No. 4* (Impingers). Due to the large quantity of liquid involved, the tester may place the impinger solutions in several containers. Clean each of the first three impingers and connecting glassware in the following manner:

1. Wipe the impinger ball joints free of silicone grease and cap the joints.

2. Rotate and agitate each impinger, so that the impinger contents might serve as a rinse solution.

3. Transfer the contents of the impingers to a 500-ml graduated cylinder. Remove the outlet ball joint cap and drain the contents through this opening. Do not separate the impinger parts (inner and outer tubes) while transferring their contents to the cylinder. Measure the liquid volume to within ±2 ml. Alternatively, determine the weight of the liquid to within ±0.5 g. Record in the log the volume or weight of the liquid present, along with a notation of any color or film observed in the impinger catch. The liquid volume or weight is needed, along with the silica gel data, to calculate the stack gas moisture content (see Method 5, Figure 5–3).

4. Transfer the contents to Container No. 4.

5. Note: In steps 5 and 6 below, measure and record the total amount of 0.1 N HNO_3 used for rinsing. Pour approximately 30 ml of 0.1 N HNO_3 into each of the first three impingers and agitate the impingers. Drain the 0.1 N HNO_3 through the outlet arm of each impinger into Container No. 4. Repeat this operation a second time; inspect the impingers for any abnormal conditions.

6. Wipe the ball joints of the glassware connecting the impingers free of silicone grease and rinse each piece of glassware twice with 0.1 N HNO_3; transfer this rinse into Container No. 4. (*Do not rinse or brush the glass-fritted filter support.*) Mark the height of the fluid level to determine whether leakage occurs during transport. Label the container to clearly identify its contents.

5.2.5 Blanks. Save 200 ml of the 0.1 N HNO_3 used for sampling and cleanup as a blank. Take the solution directly from the bottle being used and place into a glass sample container labeled "0.1 N HNO_3 blank."

5.3 Sample Preparation.

5.3.1 *Container No. 1* (Filter). Cut the filter into strips and transfer the strips and all loose particulate matter into a 125-ml Erlenmeyer flask. Rinse the petri dish with 10 ml of 50 percent HNO_3 to insure a quantitative transfer and add to the flask. (Note: If the total volume required in Section 5.3.3 is expected to exceed 80 ml, use a 250-ml Erlenmeyer flask in place of the 125-ml flask.)

5.3.2 *Containers No. 2 and No. 4* (Probe and Impingers). (Check the liquid level in Containers No. 2 and/or No. 4 and confirm as to whether or not leakage occurred during transport; note observation on the analysis sheet. If a noticeable amount of leakage had occurred, either void the sample or take steps, subject to the approval of the Administrator, to adjust the final results.) Combine the contents of Containers No. 2 and No. 4 and take to dryness on a hot plate.

5.3.3 Sample Extraction for lead. Based on the approximate stack gas particulate concentration and the total volume of stack gas sampled, estimate the total weight of particulate sample collected. Then transfer the residue from Containers No. 2 and No. 4 to the 125-ml Erlenmeyer flask that contains the filter using rubber policeman and 10 ml of 50 percent HNO_3 for every 100 mg of sample collected in the train or a minimum of 30 ml of 50 percent HNO_3 whichever is larger.

Place the Erlenmeyer flask on a hot plate and heat with periodic stirring for 30 min at a temperature just below boiling. If the sample volume falls below 15 ml, add more 50 percent HNO_3. Add 10 ml of 3 percent H_2O_2 and continue heating for 10 min. Add 50 ml of hot (80°C) deionized distilled water and heat for 20 min. Remove the flask from the hot plate and allow to cool. Filter the sample through a Millipore membrane filter or equivalent and transfer the filtrate to a 250-ml volumetric flask. Dilute to volume with deionized distilled water.

5.3.4 Filter Blank. Determine a filter blank using two filters from each lot of filters used in the sampling train. Cut each filter into strips and place each filter in a separate 125-ml Erlenmeyer flask. Add 15 ml of 50 percent HNO_3 and treat as described in Section 5.3.3 using 10 ml of 3 percent H_2O_2 and 50 ml of hot, deionized distilled water. Filter and dilute to a toal volume of 100 ml using deionized distilled water.

5.3.5 0.1 N HNO_3 Blank. Take the entire 200 ml of 0.1 N HNO_3 to dryness on a steam bath, add 15 ml of 50 percent HNO_3, and treat as described in Section 5.3.3 using 10 ml of 3 percent H_2O_2 and 50 ml of hot, deionized distilled water. Dilute to a total volume of 100 ml using deionized distilled water.

5.4 Analysis.

5.4.1 Lead Determination. Calibrate the spectrophotometer as described in Section 6.2 and determine the absorbance for each source sample, the filter blank, and 0.1 N HNO_3 blank. Analyze each sample three times in this manner. Make appropriate dilutions, as required, to bring all sample Pb concentrations into the linear absorbance range of the spectrophotometer.

If the Pb concentration of a sample is at the low end of the calibration curve and high accuracy is required, the sample can be taken to dryness on a hot plate and the residue dissolved in the appropriate volume of water to bring it into the optimum range of the calibration curve.

5.4.2 Mandatory Check for Matrix Effects on the Lead Results. The analysis for Pb by atomic absorption is sensitive to the chemical compositon and to the physical properties (viscosity, pH) of the sample (matrix effects). Since the Pb procedure described here will be applied to many different sources, many sample matrices will be encountered. Thus, check (mandatory) at least one sample from each source using the Method of Additions to ascertain that the chemical composition and physical properties of the sample did not cause erroneous analytical results.

Three acceptable "Method of Additions" procedures are described in the General Procedure Section of the Perkin Elmer Corporation Manual (see Citation 9.1). If the results of the Method of Additions procedure on the source sample do not agree within 5 percent of the value obtained by the conventional atomic absorption analysis, then the tester must reanalyze all samples from the source using the Method of Additions procedure.

5.4.3 *Container No. 3* (Silica Gel). The tester may conduct this step in the field. Weigh the spent silica gel (or silica gel plus impinger) to the nearest 0.5 g; record this weight.

6. *Calibration.*

Maintain a laboratory log of all calibrations.

6.1 Sampling Train Calibration. Calibrate the sampling train components according to the indicated sections of Method 5: Probe Nozzle (Section 5.1); Pitot Tube (Section 5.2); Metering System (Section 5.3); Probe Heater (Section 5.4); Temperature Gauges (Section 5.5); Leak-Check of the Metering System (Section 5.6); and Barometer (Section 5.7).

6.2 Spectrophotometer. Measure the absorbance of the standard solutions using the instrument settings recommended by the spectrophotometer manufacturer. Repeat until good agreement (±3 percent) is obtained between two consecutive readings. Plot the absorbance (y-axis) versus concentration in μg Pb/ml (x-axis). Draw or compute a straight line through the linear portion of the curve. Do not force the calibration curve through zero, but if the curve does not pass through the origin or at least lie closer to the origin than ±0.003

absorbance units, check for incorrectly prepared standards and for curvature in the calibration curve.

To determine stability of the calibration curve, run a blank and a standard after every five samples and recalibrate, as necessary.

7. *Calculations.*

7.1 Dry Gas Volume. Using the data from this test, calculate $V_{m(std)}$, the total volume of dry gas metered corrected to standard conditions (20°C and 760 mm Hg), by using Equation 5–1 of Method 5. If necessary, adjust $V_{m(std)}$ for leakages as outlined in Section 6.3 of Method 5. See the field data sheet for the average dry gas meter temperature and average orifice pressure drop.

7.2 Volume of Water Vapor and Moisture Content. Using data obtained in this test and Equations 5–2 and 5–3 of Method 5, calculate the volume of water vapor $V_{m(std)}$) and the moisture content B_{ws} of the stack gas.

7.3 Total Lead in Source Sample. For each source sample correct the average absorbance for the contribution of the filter blank and the 0.1 N HNO_3 blank. Use the calibration curve and this corrected absorbance to determine the μg Pb concentration in the sample aspirated into the spectrophotometer. Calculate the total Pb content $C°_{Pb}$ (in μg) in the original source sample; correct for all the dilutions that were made to bring the Pb concentration of the sample into the linear range of the spectrophotometer.

7.4 Lead Concentration. Calculate the stack gas Pb concentration C_{Pb} in mg/dscm as follows:

$$C_{Pb} = K \frac{C°_{Pb}}{V_{m(std)}}$$

Where:

K = 0.001 mg/μg for metric units.

= 2.205 lb/μg for English units.

7.5 Isokinetic Variation and Acceptable Results. Same as Method 5, Sections 6.11 and 6.12, respectively. To calculate v_s, the average stack gas velocity, use Equation 2–9 of Method 2 and the data from this field test.

8. *Alternative Test Methods for Inorganic Lead.*

8.1 Simultaneous Determination of Particulate and Lead Emissions. The tester may use Method 5 to simultaneously determine Pb provided that (1) he uses acetone to remove particulate from the probe and inside of the filter holder as specified by Method 5, (2) he uses 0.1 N HNO_3 in the impingers, (3) he uses a glass fiber filter with a low Pb background, and (4) he treats and analyzes the entire train contents, including the impingers, for Pb as described in Section 5 of this method.

8.2 Filter Location. The tester may use a filter between the third and fourth impinger provided that he includes the filter in the analysis for Pb.

8.3 In-stack Filter. The tester may use an in-stack filter provided that (1) he uses a glass-lined probe and at least two impingers, each containing 100 ml of 0.1 N HNO_3, after the in-stack filter and (2) he recovers and analyzes the probe and impinger contents for Pb. Recover sample from the nozzle with acetone if a particulate analysis is to be made.

9. *Bibliography*

9.1 Perkin Elmer Corporation. Analytical Methods for Atomic Absorption Spectrophotometry. Norwalk, Connecticut. September 1976.

9.2 American Society for Testing and Materials. Annual Book of ASTM Standards. Part 31; Water, Atmospheric Analysis. Philadelphia, Pa. 1974. p. 40–42.

9.3 Klein, R. and C. Hach. Standard Additions—Uses and Limitations in Spectrophotometric Analysis. *Amer. Lab.* 9:21–27. 1977.

9.4 Mitchell, W.J. and M.R. Midgett. Determining Inorganic and Alkyl Lead Emissions from Stationary Sources. U.S. Environmental Protection Agency, Emission Monitoring and Support Laboratory. Research Triangle Park, N.C. (Presented at National APCA Meeting. Houston. June 26, 1978).

9.5 Same as Method 5, Citations 2 to 5 and 7 of Section 7.

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(Secs. 111, 114, and 301(a) of the Clean Air Act as amended (42 U.S.C. 7411, 7414, and 7601(a)))

[FR Doc. 82-10481 Filed 4-15-82; 8:45 am]

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federal register

Friday
April 16, 1982

Part VIII

Environmental Protection Agency

Phosphate Rock Plants; Standards of Performance for New Stationary Sources; Final Rule

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 60

[AD-FRL 1782-1]

Standards of Performance for New Stationary Sources; Phosphate Rock Plants

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: Standards of performance for phosphate rock plants were proposed in the **Federal Register** on September 21, 1979 (44 FR 54970). This action finalizes standards of performance for phosphate rock plants. These standards implement the Clean Air Act and are based on the Administrator's determination that emissions from phosphate rock plants contribute significantly to air pollution which may reasonably be anticipated to endanger public health or welfare. The intended effect of the standards is to require the application of the best demonstrated systems of continuous emission reduction to new, modified, or reconstructed phosphate rock dryers, calciners, grinders, and ground rock storage and handling systems at phosphate rock plants. The designated best demonstrated systems of continuous emission reduction were determined considering costs and nonair quality health and environmental and energy impacts.

EFFECTIVE DATE: April 16, 1982.

Judicial Review: Under Section 307(b)(1) of the Clean Air Act, judicial review of this new source performance standard is available only by the filing of a petition for review in the United States Court of Appeals for the District of Columbia Circuit within 60 days of today's publication of this rule. Under Section 307(b)(2) of the Clean Air Act, the requirements that are the subject of today's notice may not be challenged later in civil or criminal proceedings brought by EPA to enforce these requirements.

ADDRESSES: Background Information Document. The background information documents for the proposed and final standards are available on request from the U.S. EPA Library (MD-35), Research Triangle Park, North Carolina 27711, telephone number (919) 541-2777 or (FTS) 629-2777 or (FTS) 629-2777. Please refer to "Phosphate Rock Plants, Background Information for Proposed Standards, Volume I," (EPA-450/3-79-017) and/or "Phosphate Rock Plants, Background Information for Promulgated Standards, Volume II" (EPA-450/3-79-017b).

Docket. Docket No. OAQPS-79-6, containing all supporting information used by EPA in developing the standards, is available for inspection and copying during normal business hours Monday through Friday at EPA's Central Docket Section, West Tower Lobby, Gallery 1, Waterside Mall, 401 M Street SW., Washington, D.C. 20460.

FOR FURTHER INFORMATION CONTACT: John D. Crenshaw, Emission Standards and Engineering Division (MD-13), U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711, telephone number: (919) 541-5624 or (FTS) 629-5624.

SUPPLEMENTARY INFORMATION:

Background

Standards of performance for new, reconstructed or modified phosphate rock plants were proposed on September 21, 1979. The proposed standards would have limited particulate emissions to 0.02 kilogram (kg) per megagram (Mg) of feed rock (0.04 lb/ton) from dryers, 0.055 kg/Mg (0.11 lb/ton) from calciners and 0.006 kg/Mg (0.012 lb/ton) from grinders. Visible emission limits for these affected facilities were proposed at zero percent opacity. A zero percent opacity limit was also proposed for ground rock handling and storage systems.

During the public comment period, a total of 16 comment letters were received. Several commenters questioned the proposed emission limits. They argued that the particulate and opacity limits for both dryers and calciners were too stringent. After reviewing these comments, EPA concluded that the data base supporting the proposed standards was incomplete because it was not representative of all combinations of control conditions that are likely to recur. EPA requested and received emission source test data from both the industrial commenters and several State air pollution control agencies. Based on this additional data, several changes were made to the proposed standards. The most significant changes were a relaxation of the particulate emission limits for calciners processing unbeneficiated rock and for dryers. The opacity limits for both dryers and calciners were also revised.

Other changes were to exclude from the standards facilities with a production capacity less than 3.6 Mg/hr (4.0 ton/hr) and to exempt ground rock storage and handling systems from the continuous monitoring requirements. Several wording and definition changes were made to clarify the applicability of the promulgated standards.

Standards of Performance

The promulgated standards apply to new, modified, or reconstructed phosphate rock dryers, calciners, grinders, and ground rock handling and storage facilities at phosphate rock plants with a maximum production rate greater than 3.6 megagrams of rock per hour (4 tons/hr). The promulgated standards will limit emissions of particulate matter to 0.03 kilogram (kg) per megagram (Mg) of rock feed (0.06 lb/ton) from phosphate rock dryers, 0.12 kg/Mg (0.23 lb/ton) from phosphate rock calciners processing unbeneficiated rock or blends of beneficiated and unbeneficiated rock, 0.055 kg/Mg (0.11 lb/ton) from phosphate rock calciners processing beneficiated rock, and 0.006 kg/Mg (0.012 lb/ton) from phosphate rock grinders. Opacity levels from grinders and ground rock storage and handling systems are limited to zero percent. Opacity levels from dryers and calciners are limited to no more than 10 percent.

The emission limits are based on the performance of baghouses or high energy venturi scrubbers. Electrostatic precipitators (ESP) are also capable of meeting the standards. However, because of the higher cost of ESP control on phosphate rock applications, ESP's were not designated as a basis for the standard.

Compliance with the mass emission limits is to be determined by source test (EPA Method 5). Continuous monitoring equipment will be required for dryers, calciners, and grinders. However, when scrubbers are used for emission control, continuous opacity monitors would not be required. Instead, the pressure drop of the scrubber and the liquid supply pressure will be monitored as indicators of the scrubber performance.

Environmental, Energy, and Economic Impacts

The promulgated standards would reduce particulate emissions from phosphate rock plants by about 99 percent from the levels that would occur with no emission control, and by about 91 percent from the levels allowed by typical State standards. These reductions would reduce nationwide particulate emissions allowed by State Implementation Plan (SIP) regulations by about 14,100 Mg (15,600 tons) per year in 1985. However, the level of control existing on many affected sources is already more stringent than that required by SIP regulations. For example, many existing grinder facilities

are controlled by baghouses to prevent the loss of valuable product rock. As a result, the actual emission reduction resulting from implementation of the standard will be less than 14,100 Mg (15,600 tons). The standards will cause a reduction in particulate matter emissions from the level which would occur with typical existing industry control practices of about 3,300 megagrams (3,600 tons) in 1985 and 5,100 megagrams (5,600 tons) in 1990.

None of the alternative control technologies required by these standards (baghouse, scrubber) would result in significant adverse environmental impacts. If scrubbers are used to meet the requirements of the standard, there would be a small increase in solid waste disposal and water pollution. However, the incremental increase (over the prevailing controls) of solid materials and wastewaters produced during control of emissions is insignificant in comparison with the large volume of such wastes generated by production processes. Baghouse technology is marginally more environmentally acceptable than other control alternatives because it generates no liquid effluents.

Compliance with the promulgated standards will require additional electrical energy above that required at the SIP level of control. The incremental increase in energy will depend on the type of control system that is selected. If high-energy venturi scrubbers are used, the total process energy requirements will increase by 8 percent above the energy required at the existing SIP level of control. The incremental energy increase above the SIP level would be 5 percent with baghouses.

The costs of operating control equipment that would be needed to attain the promulgated standards were estimated using model plants. Phosphate rock plants are concentrated primarily in Florida, North Carolina, Idaho, Wyoming, Utah and Montana. Phosphate rock deposits in North Carolina and Florida consist of a consolidated mass of phosphate pebbles and clays normally occurring below the water table. Western deposits consist of hard rock. Because of these processing differences, costs were presented separately for eastern and western plants. A typical Florida plant was selected as representative of eastern facilities. The control costs per ton of production are typically lower for eastern plants because they have a larger capacity than western plants.

The annualized cost of installing and operating prevailing controls used to meet existing State standards at typical eastern phosphate rock plants is estimated at $0.35 per megagram. The additional cost of employing control technology to meet the promulgated standards at a new eastern plant is estimated at $0.02/megagram when using baghouses and $0.07/megagram for scrubbers.

The annualized control cost of existing SIP standards at a typical new western plant is $0.87/megagram. The additional cost of using control technology to meet the promulgated standards at new western plants is estimated at $0.08/megagram for baghouse control and $0.28/megagram for scrubbers.

The incremental cost of the promulgated standards above SIP control costs will have negligible impacts on the profitability of the plant and the future growth of the phosphate rock industry. By the year 1985, compliance with the standards would increase the industry cost of production of phosphate rock by 0.1 percent (baghouse controls) to 0.2 percent (scrubber controls) above the cost to meet existing SIP regulations. A more detailed discussion of the economic analysis is discussed in the Background Information Document for Proposed Standards, Volume I.

Public Participation

In accordance with Section 117 of the Clean Air Act, proposal of the standards was preceded by consultation with appropriate advisory committees, independent experts, industry representatives, and Federal departments and agencies. The proposed standards were published in the **Federal Register** on September 21, 1979, with a request for public comment. The public comment period was extended to February 15, 1980, to allow interested persons to obtain and review the proposed standards and the background information document for proposal. To provide interested persons the opportunity for oral presentation of data, views, or arguments concerning the proposed standards, a public hearing was held on October 25, 1979, at Research Triangle Park, North Carolina. The hearing was open to the public and each attendee was given the opportunity to comment on the proposed standards.

Significant Comments and Changes to the Proposed Regulations

Many comment letters received by EPA contained multiple comments. A detailed discussion of these comments and EPA's responses to them are presented in the Background Information for Promulgated Standards, Volume II. The most significant comments and changes made to the proposed standards have been grouped according to topic and are discussed below.

General

Several commenters were concerned with the applicability of the proposed standards. They questioned whether the standard was intended to apply to mining operations, elemental phosphorus plants, and ground rock transfer facilities at fertilizer plants.

The promulgated standard is not intended to apply to crushing or mining, beneficiation, thermal defluorination, elemental phosphorus production or ground rock handling at fertilizer plants. The standards are intended to apply to new, reconstructed, or modified phosphate rock dryers, calciners, grinders, and ground rock storage and handling systems at phosphate rock plants. There have been several wording and definition changes in the standards to clarify the applicability of the promulgated standards.

Several commenters questioned the need for a standard since some existing facilities were not causing ambient air quality violations.

The purpose of new source performance standards is not limited to ensuring compliance with ambient air quality standards. The primary purpose of new source performance standards is to prevent future air pollution problems and to prevent costly retrofits of control equipment that might result from such problems. New source performance standards will require the uniform application of control requirements nationwide and will prevent unfair competition between States for industrial development based on varying environmental regulations.

As required by Section III of the Clean Air Act, the Administrator has published a list of categories of sources which contribute significantly to air pollution which may reasonably be anticipated to endanger public health or welfare (Section III(b)(1)(A)), and for which new source performance standards will therefore be developed (40 CFR 60.16, 44 FR 49222, August 21, 1979). The proposed list was published in the **Federal Register** with a request for public comment. After review of the comments, the list was published on August 21, 1979. The sources on this list were selected and ranked according to an established screening procedure. Phosphate rock plants ranked according to an established screening procedure. Phosphate rock plants ranked 16th in priority of the 59 sources on the list. In the Administrator's judgment the

revised estimate of emissions for this category of sources still justifies the conclusion that it contributes significantly to air pollution which may reasonably be anticipated to endanger public health or welfare.

Environmental Impact

Several commenters questioned the need for a standard because they felt the environmental benefits presented with the original proposal were exaggerated. The commenters felt that the emission reductions resulting from implementation of the standard were exaggerated because they were based on outdated and excessive production forecasts. These commenters argued that EPA should use the most recent production estimates from the Bureau of Mines. In addition, several commenters pointed out that existing sources were controlled at a more stringent level than actually required by existing State Implementation Plan regulations, which reduces the projected air quality improvement resulting from implementation of the standard.

EPA has reevaluated the environmental benefits presented with the original proposal. The reevaluation of environmental benefits as presented in Section 2.1.2 of the "Background Information for Promulgated Standards, Volume II" indicates a significant decrease in the environmental benefits of the standards. However, in the Administrator's judgement, the revised estimates of environmental benefits still justify the implementation of the standards.

The environmental impacts presented with the original proposal were based on an expected 5-percent annual increase in production. This expected increase was based on actual yearly production figures for 1950 compared to those projected for 1980. The projected production was based on data from the Bureau of Mines (1971). However, annual phosphate rock production has been fluctuating recently. Therefore, the most recent Bureau of Mines (1979) production forecast data were obtained to more accurately project the impact of the standards.

These Bureau of Mines production forecast data show that U.S. phosphate rock production will increase from 47.0 million megagrams in 1977 to 64.0 million megagrams in 1986, with a decrease to 56.0 million megagrams in 1995. With the routine replacement of existing equipment, approximately 23.3 million megagrams of phosphate rock production will be subject to the promulgated standards by 1985. This figure was used as the basis for the environmental benefits presented in this notice in "Environmental, Energy and Economic Impacts".

A lower size cutoff was requested to exclude from the standards small pilot scale and laboratory facilities used for testing and research. Economic analysis, presented in the "Background Information for Promulgated Standards," indicates that emissions from facilities with low production capacities are relatively small and the cost of controlling these emissions is excessive. The Administrator, therefore, has determined that an exemption for small facilities is appropriate. The promulgated standards apply only to plants with a production capacity greater than 3.6 megagrams per hour (4 tons/hr). This capacity is representative of the upper limit of the size range for testing and research facilities. There are no existing production facilities with capacities less than 3.6 mg/hr (4.0 tons/hr).

Particulate Emission Limits

Several commenters indicated that the proposed particulate matter emission limits for phosphate rock dryers and calciners were too stringent to be achieved on a continuous basis. The commenters contended that the proposed emission limits from dryers and calciners were not based on the performance of control systems operating on worst case particulate emission conditions. One of the problems cited was that the Agency's data base was outdated. In order to evaluate the comments, EPA requested source test data from the industrial commenters. In cases where the commenters could not supply data to support their position, EPA solicited data from State air pollution control agencies. The evaluation of the revised data base indicated that the proposed emission limits for dryers and calciners could not be achieved continuously under all operating conditions which are likely to recur. Therefore, the emission limits for both calciners and dryers have been revised.

The major variables that have the potential to affect emission levels from phosphate rock dryers and calciners are the type of feed rock and the type of fuel. Industrial experience indicated that the most important variable affecting particulate matter emission levels from dryers and calciners is the feed rock characteristics. With residual oil or coal firing, the process rock will account for greater than 80 and 90 percent of the uncontrolled emissions from dryers and calciners, respectively. Feed rock varies from mine site to mine site. Rock types vary from coarse pebbles to fine concentrates with many blends of rock between these extremes. Surface properties, organic content, level of beneficiation, and residence time in the processing unit vary with rock type. Beneficiation removes fines and increases the average particle size of emissions. Smaller average particle size causes the most difficult control situations. Therefore, beneficiation reduces emission levels. Increased residence time increases the volume of air per unit of rock and, therefore, increases the emission rate per unit of rock. These variations can effect both the particulate matter emission levels and the particle size distribution of the emissions. Florida coarse pebble rock and unbeneficiated Western rock are the least beneficiated and have longest unit residence times. As a result, they have the smallest average particle size and highest emission levels of all the phosphate rock types. Unbeneficiated Western rock, which has a slightly higher percentage of fines and smaller average particle size than coarse pebble, is the most difficult control case.

The four combustion fuels used in dryers and calciners are natural gas, distillate and residual oil, and coal. The particulate matter emissions resulting from the combustion of natural gas and distillate oil are insignificant, and will not affect particulate emission levels or the designated best control equipment performance. However, the combustion of both residual oil and coal produces significant amounts of particulate matter. Although coal usually produces a greater mass of particulate matter, residual oil combustion produces a smaller average particle size that is more difficult to control. An analysis of control device performance indicates that particulate levels after control would be higher with residual oil firing than with coal firing. Therefore, the Administrator has determined that residual oil-fired units represent the most adverse control situation with respect to fuel.

The data base of worst-case conditions for dryers consisted of five source tests from two dryer facilities processing coarse pebble rock and firing residual oil. Because dryers are not used in conjunction with unbeneficiated Western rock, these data represent the most adverse control conditions for dryers. An evaluation of the performance of a high energy venturi scrubber on these sources indicated an achievable emission limit of 0.03 kg/Mg (0.06 lb/ton). Therefore, the particulate matter emission limit for phosphate rock dryers had been revised from the proposed 0.02 kg/Mg (0.04 lb/ton) to 0.03 kg/Mg (0.06 lb/ton).

Additional source test data were acquired for calciners processing unbeneficiated Western rock. The data acquired were from the only existing facility calcining unbeneficiated Western rock. The data were from a natural gas-fired calciner controlled with a high energy wet scrubber. During the tests used as the basis for the emission limit, the calciner was processing a blend of unbeneficiated and beneficiated rock. The highest controlled emission level during the tests was 0.11 kg/Mg (0.21 lb/ton). The analysis of the tests indicated that this controlled emission level is representative of the highest level that would occur with any mix of beneficiated and unbeneficiated rock.[1] Although this unit is processing the worst-case rock type, there is a potential for residual oil or coal firing of new units. An analysis of the impacts of residual oil and firing indicate that residual oil would have the greater impact on controlled emission levels. The analysis indicated that residual oil firing could increase controlled emissions by about 0.01 kg/Mg (0.02 lb/ton). Therefore, a particulate matter emission limit of 0.12 kg/Mg (0.23 lb/ton) has been added to the standards for calciners processing unbeneficiated rock or blends of beneficiated and unbeneficiated rock. Calciners processing blends with a small percentage of unbeneficiated rock could probably comply with the proposed emission limit of 0.055 kg/Mg (0.11 lb/ton). However, existing data are insufficient to determine a precise relationship between emission level and blend ratios. The promulgated emission limit, therefore, applies to all mixtures of unbeneficiated and beneficiated rock.

Because the majority of new calciners will process beneficiated rock only, an emission limit for calciners based solely on unbeneficiated rock would allow new sources processing beneficiated rock to comply with the emission limits with less than the best demonstrated control systems. Therefore, the originally proposed particulate emission limit of 0.055 kg/Mg (0.11 lb/ton) is retained for facilities calcining beneficiated rock. The potential impacts of residual oil or coal firing are accounted for in this emission limit.

A comment was also made that the particulate matter emission limits could not be achieved continuously because it would require continuous operation of the control equipment at the maximum performance level. As required by the Clean Air Act, the promulgated particulate matter emission limits are based on the performance of the best available control equipment on the worst case uncontrolled emission levels. The best control systems have been demonstrated to be continuously effective. Therefore, there should be no problems achieving the standards if the control equipment is properly maintained and operated. The costs of operation and maintenance were included in the economic analysis of the standards and were concluded to be reasonable.

Opacity Standard

Several commenters questioned the need for opacity standards since particulate matter emissions were also subjected to mass emission limits.

Opacity limits are included in the standards to lower compliance costs and 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 are too expensive 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. See Clean Air Act, Section 302(k). The promulgated 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 to aid in controlling mass emission under NSPS. "Portland Cement Association v. Train," 513F. 2d 506, 508 (1975).

In criticizing the opacity limits, several commenters recommended that the opacity limits for dryers and calciners should be set at 5- or 10-percent opacity. EPA has reevaluated the proposed opacity standards, considering the revisions in the particulate emission limits, and has revised the opacity limits for phosphate rock dryers and calciners to 10 percent.

Typically, visible emission standards are based on opacity observations collected simultaneously with the particulate emission tests on which the mass emission limits are based. In this case, the source test data that were used as the basis for the revised dryer and calciner particulate limits did not contain corresponding opactiy data. In the absence of corresponding opacity data, the visible emission limits for dryers and calciners were based on engineering evaluations.

The evaluations involved the use of opacity observations from an ESP-controlled phosphate rock dryer and an empirical correlation between particle concentration and opacity. Although ESP's are not designated as a basis for this standard, the visible emissions from this unit are characteristic of any dryer or calciner with a similar particle concentration. The correlation of concentration and opacity was taken from an EPA study of an asphalt aggregate dryer.[2] The use of the asphalt study was judged reasonable because asphalt aggregate dryers, phospate rock dryers, and phospate rock calciners have similar outlet particulate concentrations and particle size distributions.

The observed opacity from the ESP-controlled dryer was 7.7 percent. This level was corrected to 6 percent to adjust for an over-designed stack. Particulate mass emissions were 0.02 kg/Mg (0.039 lb/ton) at the time of the opacity observations, with a corresponding particulate concentration of 0.023 g/m^3 (0.010 gr/acf). The emission test used as the basis for the promulgated particulate emission limit of 0.03 kg/Mg (0.06 lb./ton) for phosphate rock dryers had a corresponding particulate concentration of 0.037 g/m^3 (0.016 gr/acf). The asphalt correlation was used to estimate the impact of a 0.006 gr/acf increase on a base of 6 percent opacity. Based on this approach the opacity level expected at 0.037 g/m^3 (0.016 gr/acf) would be approximately 7 percent. Allowing for a safety margin in the calculations, the opacity limit for dryers was set at 10 percent.

The particulate concentration used as the basis for the mass emission limit for calciners processing unbeneficiated rock was 0.06 g/m^3 (0.025 gr/acf). Based on the same approach used for dryers, the expected opacity at this concentration would be appoximately 8 percent. The particulate concentration used as the basis for the mass emission limit for

[1] Phosphate Rock Plants. Background Information for Promulgated Standards. Volume II. EPA-450/3-79-017b. p. 2-20.

[2] In-Stack Transmissometer Measurement of Particulate Opacity and Mass Concentration. U.S. Environmental Protection Agency. Publication No. EPA-650/2-74-120. November 1974. p. 34-35.

calciners processing beneficiated rock was 0.073 g/m³ (0.032 gr/acf). However, this unit was controlled by a 3.0 kPa (12 inches of water) pressure drop venturi scrubber. If the pressure drop is increased to the designated best level of control at 7.5 kPa (30 inches of water), the particulate concentration should be reduced to 0.23 g/m³ (0.010 gr/acf). At this concentration an opacity level of approximately 6 percent would be expected. Allowing for a safety margin in the calculations, a 10 percent opacity standard was set for calciners processing either beneficiated or unbeneficiated rock.

Although the opacity limits for calciners and dryers have been revised, the proposed zero percent opacity limit has been retained for grinders and ground rock storage and handling systems. Several commenters criticized the concept of zero percent opacity. They contended that any deviation of opacity above zero percent would cause the average for the observation period to exceed zero percent and would prevent compliance with the standards.

The zero percent opacity limit for grinders and ground rock storage and handling systems was retained because all data base opacity observations of well-controlled sources had zero percent opacity. Method 9 procedures can allow some visible emissions during a demonstration of compliance with the zero percent limit. Opacity readings are recorded every 15 seconds for 6 minutes (24 readings). These readings are recorded in 5 percent increments (i.e., 0, 5, 10, etc.). The arithmetic average of the 24 readings rounded off to the nearest whole number (i.e., 0.4 would be rounded off to 0) is the value of opacity used for determining compliance with the opacity standards. Consequently, a zero percent opacity standard does not necessarily mean there are never any visible emissions. It means either that visible emissions during a 6-minute period are insufficient to cause a certified observer to record them as 5 percent opacity, or that the average of the twenty-four 15-second readings is calculated to be less than 0.5 percent. Therefore, although emissions released to the atmosphere from a grinder or ground rock handling and storage system may be visible to a certified observer, at some time during the observation period, the source may still be found in compliance with the zero percent opacity standard.

The commenters also requested that the standards contain site-specific relief from the opacity limits in situations where particulate emission limits were being achieved while opacity limits were violated. Such a provision is not necessary. In specific cases where it can be demonstrated that the opacity standards are being violated while the particulate mass emission limits are being met, provisions for individual review and site-specific relief are included in the general provisions to these regulations (40 CFR 60.11(e)).

Continuous Monitoring

Several comments indicated a misunderstanding of the purpose and requirements for continuous monitoring equipment. The commenters felt that the purpose of the continuous monitors was to demonstrate compliance with the opacity limits. They indicated that continuous opacity monitors could not be used to accurately determine compliance with the opacity limits.

Continuous opacity monitors are not intended for demonstration of compliance with opacity or particulate matter standards. Only EPA Reference Methods can be used to demonstrate compliance. The purpose of continuous monitoring at phosphate rock plants is to ensure that emission control equipment is properly maintained and operated continuously. Continuous monitoring equipment has been demonstrated to be accurate, reliable, and suitable for purposes of monitoring excess emissions. Without continuous monitoring requirements there would be no incentive for the proper operation and maintenance of emission control equipment except during performance testing. Further, the United States Court of Appeals for the District of Columbia Circuit has specifically upheld the use of continuous opacity monitors in "National Lime Association v. EPA," 627 F. 2d 416, 450–451 (1980).

A comment was made that the proposed requirement for continuous monitoring equipment on ground rock storage and handling systems was unreasonable. The commenter pointed out that transfer points on ground rock handling systems were often controlled by small baghouses which were far less expensive than continuous monitoring equipment.

The requirement of continuous monitoring equipment on ground rock handling and storage systems has been reconsidered and has been determined to be unnecessary. The design of ground rock storage and handling systems vary greatly from plant to plant. Therefore, no typical handling and storage system can be defined. Most of the potential emissions from storage and handling systems are fugitive in nature and can be prevented by proper operation and maintenance. Because of the fugitive nature of emissions, it is difficult to define or predict specific emission points and emission control equipment requirements. Therefore, storage and handling systems are subject only to visible emission limits, compliance with which can be routinely demonstrated with Method 9. The annualized cost of a typical opacity monitoring system is about $12,500 per year (1978). The absolute costs of continuous monitoring systems is considered excessive relative to the control costs. Therefore, the requirement for continuous opacity monitors on ground rock storage and handling systems has been deleted.

Two commenters stated that an opacity averaging period of 6 minutes with overlapping time intervals would produce an excessively large and useless volume of paperwork.

The 6-minute opacity averaging periods required of continuous opacity monitors are discrete successive 6-minute periods and are not composed of overlapping time intervals. The general provisions (40 CFR 60.13(e)(i)) state that continuous opacity monitors shall complete a minimum of one cycle of sampling and analyzing for each successive 10-second period and one cycle for data recording for each successive 6-minute period. Therefore, the volume of data produced will not be as large as stated by the commenters.

Emission Control Technology

Several commenters questioned the designation of baghouses as best available control technology. The commenters stated that no baghouses are in current use on existing dryers or calciners, and that technological problems associated with high temperatures and moisture blinding of bags would limit their use.

EPA agrees that there are no baghouses currently in use on phosphate rock dryers or calciners. However, baghouses have been installed and are operating effectively on similar applications, including kaolin rotary kiln dryers and asphalt aggregate dryers. The control conditions in these applications are more severe than those typically occurring with phosphate rock dryers or calciners. Baghouse manufacturers have stated that baghouses could be applied successfully to dryers and calciners. Design and operational procedures are available which prevent high temperature damage and moisture blinding. These include insulation of the baghouse and duct work, high temperature bags and preheating of the unit before cold start-

up.[3] Furthermore, baghouses are not the only technique that can be used to comply with the promulgated emission limits. If an operator believes that due to site-specific circumstances, there is economic risk in using a baghouse, then a high energy venturi scrubber can be used to comply with the standards.

The comment was made that Volume I of the BID should not have contained ESPs as a control technique because it was stated in Volume I that ESPs were not the best demonstrated system, although they are equally efficient as baghouses and high-energy venturi scrubbers. The commenters further questioned EPA's judgment that ESPs were equally as efficient as baghouses or high-energy venturi scrubbers on dryers and calciners. The commenters felt that the source test data base did not support this judgment, and ESPs should not be used as a basis for the standards.

Alternative particulate control equipment options with control efficiency levels in the range of, or above, existing controls for phosphate rock plants are baghouses, venturi scrubbers, and ESPs. Therefore, ESPs were analyzed in Volume I as a control alternative. The level of control required by the standards is estimated to be approximately 99.3 percent when processing the worst-case rock types. EPA agrees that the source tests of ESPs presented in the BID, Volume I, do not achieve this level of control. The ESPs tested achieved efficiencies in the range of 93 to 99 percent efficiency. However, ESP efficiency is a direct function of the collector plate area to gas volume ratio. By increasing the collector plate area of the tested ESPs, the efficiency can be increased to 99.3 percent. The economic evaluation of ESPs presented in Volume I of the BID presented the cost of ESPs at the increased plate area to gas volume ratio necessary to achieve 99.3 percent control. Because the cost of ESPs is primarily a function of collector plate area, the larger plate area results in significantly higher costs. The annualized costs of an ESP on a model dryer or calciner are 2 to 2.5 times higher than high-energy venturi scrubber or baghouse costs on the same source. Because of these higher costs, ESPs were not designated as a basis for the standards. The promulgated emission limits are based on the performance of high-energy venturi scrubbers and baghouses.

[3] Phosphate Rock Plants. Background Information for Promulgated Standards. Volume II. EPA-450/3-79-017b. p. 2-26, 27.

Economic Impact

Several commenters stated that the costs to control dryers and calciners to the required level were underestimated, because the costs were based on typical uncontrolled emission rates rather than worst case uncontrolled emission rates. The promulgated emission limits represent the level of control achievable with the best demonstrated control systems on worst case emission conditions. The available control options which are capable of achieving the promulgated emission limits are baghouses and high energy venturi scrubbers. The reevaluation of worst case emission levels caused a revision in the achievable emission limits for dryers and calciners processing unbeneficiated rock. These revisions were caused by changes in the inlet loadings and particle size distributions to the control device. However, there was no change in the design or operating parameters of the designated best emission control systems. Therefore, there is no change in the costs of the control alternatives from those presented in the analysis for the proposed standard.

Other commenters stated that the control cost estimates should be higher for Western plants since unbeneficiated Western rock contains a higher percentage of fines. Unbeneficiated Western rock does have a typically higher percentage of fines than Eastern rock. However, the analysis of control costs for the proposed standard included the economic analysis of a typical Western plant. The economic analysis of the standards presented in Chapter 7 of the "Background Information for Proposed Standards, Volume I," indicates that, while control costs may be higher for Western plants, the control costs are not excessive.

The commenters also felt that control costs for Western plants were underestimated because no phosphate rock dryer had been costed for the typical model Western plant. EPA also agrees that the addition of a dryer to a model Western rock processing facility will result in increased annual control costs for typical Western plants. However, existing SIP regulations already require dryer emissions control usually achieved with wet scrubbers. Based on industrial comments, industry would probably install high-energy venturi scrubbers as a means of complying with the promulgated standards. With implementation of the promulgated standards, there would be no significant increase in installation costs, because scrubber installation costs do not vary significantly at different efficiency levels. There would, however, be an increase in operating costs for the higher energy venturi scrubber. For a typical 160-ton/hr dryer, the increased annualized cost of the promulgated standard above the existing level of control would be approximately $0.06 (1978) per megagram ($0.07/ton) of product rock. The price of phosphate rock under the promulgated standard would increase from $24.53 per megagram ($22.25/ton) to $24.61 per megagram ($22.32/ton) in 1978 dollars. Therefore, there would be no significant change in the economic impact of the promulgated standard with the addition of a dryer facility at a Western plant.

The commenters also questioned the costs of applying a baghouse to phospate rock dryers or calciners. The commenters stated that an auxiliary heat source would be necessary to maintain the required temperature differential necessary to prevent condensation of moisture on the bags. An auxiliary heat source for baghouses on phosphate rock dryers and calciners was not costed or addressed because it should be unnecessary. The temperature differential necessary to prevent condensation can be maintained by properly insulating the baghouse and all ductwork to prevent heat loss. During start-up, the baghouse can be heated to operating temperature by operating the burners at low fire with no rock in the dryer or calciner. Baghouses are operating on similar applications such as asphalt dryers and kaolin dryers without auxiliary heat sources.

The commenters also argued that baghouse costs for calciners had been underestimated because the air flow that was costed for the model facility was too low. However, as pointed out in Volume I of the BID, calciner air flows for typical 45.4 Mg/hr (50 ton/hr) units range from 850 to 1,700 standard m^3/min (30,000–60,000 scfm). At a typical exhaust temperature of 120° C, these figures would present an air flow range of 1,160 to 2,310 actual m^3/min (40,800 to 81,600 acfm). The air volume costed for the model calciner facility was 2,930 actual m^3/min (103,460 acfm) for a 54 Mg/hr (60 ton/hr) unit. Therefore, the air flow costed is representative of the upper range of air flows and does not cause an underestimation of control costs.

Commenters also questioned the cost effectiveness of continuous monitoring equipment. They felt that the costs associated with continuous monitoring had not been adequately evaluated. The cost to purchase, install, operate, and maintain continuous opacity monitoring

equipment was addressed and evaluated during the development of the standards. The annualized cost of a typical continuous opacity monitoring system is about $12,500 (1978 dollars) per year. This cost is relatively minor compared to the annualized cost of the emission control equipment required by the promulgated standard (about 4.2 percent of a venturi scrubber on a 145-Mg/hr dryer) and was concluded to be reasonable.

The comment was also made that the control costs required by the standard were underestimated because the costs required to install, calibrate, maintain, and operate a device for measuring phosphate rock mass feed to the emission sources were not included in the control costs.

The cost of rock feed rate (by weight) measurement equipment was addressed and considered during the economic analysis of the standards. Rock feed measuring equipment is normally utilized at phosphate rock plants to measure production process feed rates and is not solely a part of control requirements. The installed cost of rock feed measurement equipment is about $14,000 (1978) for a facility processing 135 megagrams per hour (150 tons/hr) of rock, and has an annualized cost of about $3,500 (1978) per year. These costs are insignificant (about 1.1 percent of the annualized cost of a venturi scrubber on a 145/Mg/hr dryer) when compared to the control equipment costs of the same facility.

Docket

The docket is an organized and complete file of all the information considered by EPA in the development of the rulemaking. The docket is a dynamic file, since material is added throughout the rulemaking development. The docketing system is intended to allow members of the public and industries involved to readily identify and locate documents so that they can intelligently and effectively participate in the rulemaking process. Along with the statement of basis and purpose of the promulgated standards and EPA responses to significant comments, the contents of the docket will serve as the record in case of judicial review (Section 307(d)(7)(A)).

Miscellaneous

Standards of performance for new sources established under Section 111 of the Clean Air Act reflect the degree of emission limitation achievable through application of the best technological system of continuous emission reduction which (taking into consideration the cost of achieving such emission reduction, and nonair-quality health, environmental impact, and energy requirements) the Administrator determines has been adequately demonstrated.

Althought there may be emission control technology available that can reduce emissions below those levels required to comply with the standards of performance, this technology might not be selected as the basis of standards of performance because of the costs associated with its use. Accordingly, standards of performance should not be viewed as the ultimate in achievable emission control. In fact, the Act requires (or has the potential for requiring) the imposition of a more stringent emission standard in several situations. For example, applicable costs do not play as prominent a role in determining the "lowest achievable emission rate" for new or modified sources located in nonattainment areas (i.e., those areas where statutorily mandated health and welfare standards are being violated). In this respect, Section 173 of the Act requires that new or modified sources constructed in an area which violates the National Ambient Air Quality Standards (NAAQS) must reduce emissions to a level that reflects the "lowest achievable emission rate" (LAER), as defined in Section 171(3), for such category of source. The statute defines LAER as that rate of emissions based on the following, whichever is more stringent:

(A) The most stringent emission limitation contained in the implementation plan of any State for such class or category of source, unless the owner or operator of the proposed source demonstrates that such limitations are not achievable; or,

(B) The most stringent emission limitation achieved in practice by such class or category of source.

In no event can the emission rate exceed any applicable new source performance standard (Section 171(3)).

A similar situation may arise under the prevention of significant deterioration of air quality provisions of the Act (Part C). These provisions require that certain sources (referred to in Section 169(1)) employ "best available control technology" (as defined in Section 169(3)) for all pollutants regulated under the Act. Best available control technology (BACT) must be determined on a case-by-case basis, taking energy, environmental, and economic impacts and other costs into account. In no event may the application of BACT result in emissions of any pollutants which will exceed the emissions allowed by any applicable standard established pursuant to Section 111 (or 112) of the Act.

In all events, State Implementation Plans (SIPS) approved or promulgated under Section 110 of the Act must provide for the attainment and maintenance of National Ambient Air Quality Standards (NAAQS) designed to protect public health and welfare. For this purpose, SIPs must in some cases require greater emission reductions than those required by standards of performance for new sources.

Finally, States are free under Section 116 of the Act to establish even more stringent emission limits than those established under Section 111, or those necessary to attain or maintain the NAAQS under Section 110. Accordingly, new sources may in some cases be subject to limitations more stringent than EPA's standards of performance under Section 111, and prospective owners and operators of new sources should be aware of this possibility in planning for such facilities.

EPA will review this regulation 4 years from the date of promulgation. This review will include an assessment of such factors as the need for integration with other programs, the existence of alternative methods, enforceability, improvements in emission control technology and reporting requirements. The reporting requirements in this regulation will be reviewed as required under EPA's sunset policy for reporting requirements in regulations.

Under Executive Order 12291, EPA must judge whether a regulation is "Major" and therefore subject to the requirement of a Regulatory Impact Analysis. This regulation is not Major because: (1) The national annualized compliance costs, including capital charges resulting from the standards total less than $100 million; (2) the standards do not cause a major increase in prices or production costs; and (3) the standards do not cause significant adverse effects on domestic competition, employment, investment, productivity, innovation or competition in foreign markets. This regulation was submitted to the Office of Management and Budget (OMB) for review as required by Executive Order 12291. The docket is available for public inspection at EPA's Central Docket Section, West Tower Lobby, Gallery 1, Waterside Mall, 401 M Street, SW., Washington, D.C. 20460.

Although no regulatory impact analysis is required, an economic impact assessment of alternative emission standards has been prepared, as required under Section 317 of the Clean Air Act, and is included in the

"Background Information Document for Proposal for Phosphate Rock Plants, Volume I." EPA considered all the information in the economic impact analysis in assessing the cost of the standard.

In addition to economics, the cost effectiveness of alternative standards was evaluated in order to determine the least costly way to reduce emissions and to assure that the controls required by this rule are reasonable relative to other regulations for particulate matter. The cost per ton of pollutant removed was computed for each process affected by the standard, both on an average and incremental basis. The incremental cost ranged from $51 to $235 per ton of particulate removed, which compares favorably with particulate matter control at other industrial sources where costs typically range up to $1,000 per ton and in certain cases may exceed $2,000 per ton. Additional detail on this analysis can be found in the docket.

The information collection activity contained in this Final Rule is not covered by the Paperwork Reduction Act (PRA) because there are fewer than ten respondents.

List of Subjects in 40 CFR Part 60:

Air pollution control, Aluminum, Ammonium sulfate plants, Cement industry, Coal, Copper, Electric power plants, Glass and glass products, Grains, Intergovernmental relations, Iron, Lead, Metals, Motor vehicles, Nitric acid plants, Paper and paper products industry, Petroleum, Phosphate, Sewage disposal, Steel, Sulfuric acid plants, Waste treatment and disposal, Zinc.

Dated: April 9, 1982.

Anne M. Gorsuch,

Administrator.

PART 60—STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES

40 CFR Part 60 is amended by adding a new subpart as follows:

Subpart NN—Standards of Performance for Phosphate Rock Plants

Sec.

Authority: Secs. 111 and 301(a) of the Clean Air Act, as amended, (42 U.S.C. 7411, 7601(a)), and additional authority as noted below:

Subpart NN—Standards of Performance for Phosphate Rock Plants

§ 60.400 Applicability and designation of affected facility.

(a) The provisions of this subpart are applicable to the following affected facilities used in phosphate rock plants which have a maximum plant production capacity greater than 3.6 megagrams per hour (4 tons/hr): dryers, calciners, grinders, and ground rock handling and storage facilities, except those facilities producing or preparing phosphate rock solely for consumption in elemental phosphorus production.

(b) Any facility under paragraph (a) of this section which commences construction, modification, or reconstruction after September 21, 1979, is subject to the requirements of this part.

§ 60.401 Definitions.

(a) "Phosphate rock plant" means any plant which produces or prepares phosphate rock product by any or all of the following processes: Mining, beneficiation, crushing, screening, cleaning, drying, calcining, and grinding.

(b) "Phosphate rock feed" means all material entering the process unit including, moisture and extraneous material as well as the following ore minerals: Fluorapatite, hydroxylapatite, chlorapatite, and carbonateapatite.

(c) "Dryer" means a unit in which the moisture content of phosphate rock is reduced by contact with a heated gas stream.

(d) "Calciner" means a unit in which the moisture and organic matter of phosphate rock is reduced within a combustion chamber.

(e) "Grinder" means a unit which is used to pulverize dry phosphate rock to the final product size used in the manufacture of phosphate fertilizer and does not include crushing devices used in mining.

(f) "Ground phosphate rock handling and storage system" means a system which is used for the conveyance and storage of ground phosphate rock from grinders at phosphate rock plants.

(g) "Beneficiation" means the process of washing the rock to remove impurities or to separate size fractions.

§ 60.402 Standard for particulate matter.

(a) On and after the date on which the performance test required to be conducted by § 60.8 is completed, no owner or operator subject to the provisions of this subpart shall cause to be discharged into the atmosphere:

(1) From any phosphate rock dryer any gases which:

(i) Contain particulate matter in excess of 0.030 kilogram per megagram of phosphate rock feed (0.06 lb/ton), or

(ii) Exhibit greater than 10-percent opacity.

(2) From any phosphate rock calciner processing unbeneficiated rock or blends of beneficiated and unbeneficiated rock, any gases which:

(i) Contains particulate matter in excess of 0.12 kilogram per megagram of phosphate rock feed (0.23 lb/ton), or

(ii) Exhibit greater than 10-percent opacity.

(3) From any phosphate rock calciner processing beneficiated rock any gases which:

(i) Contain particulate matter in excess of 0.055 kilogram per megagram of phosphate rock feed (0.11 lb/ton), or

(ii) Exhibit greater than 10-percent opacity.

(4) From any phosphate rock grinder any gases which:

(i) Contain particulate matter in excess of 0.006 kilogram per megagram of phosphate rock feed (0.012 lb/ton), or

(ii) Exhibit greater than zero-percent opacity.

(5) From any ground phosphate rock handling and storage system any gases which exhibit greater than zero-percent opacity.

§ 60.403 Monitoring of emissions and operations.

(a) Any owner or operator subject to the provisions of this subpart shall install, calibrate, maintain, and operate a continuous monitoring system, except as provided in paragraphs (b) and (c) of this section, to monitor and record the opacity of the gases discharged into the atmosphere from any phosphate rock dryer, calciner, or grinder. The span of this system shall be set at 40-percent opacity.

(b) For ground phosphate rock storage and handling systems, continuous monitoring systems for measuring opacity are not required.

(c) The owner or operator of any affected phosphate rock facility using a wet scrubbing emission control device shall not be subject to the requirements in paragraph (a) of this section, but shall install, calibrate, maintain, and operate the following continuous monitoring devices:

(1) A monitoring device for the continuous measurement of the pressure loss of the gas stream through the scrubber. The monitoring device must be certified by the manufacturer to be accurate within ±250 pascals (±1 inch water) gauge pressure.

(2) A monitoring device for the continuous measurement of the

scrubbing liquid supply pressure to the control device. The monitoring device must be accurate within ±5 percent of design scrubbing liquid supply pressure.

(d) For the purpose of conducting a performance test under § 60.8, the owner or operator of any phosphate rock plant subject to the provisions of this subpart shall install, calibrate, maintain, and operate a device for measuring the phosphate rock feed to any affected dryer, calciner, or grinder. The measuring device used must be accurate to within ±5 percent of the mass rate over its operating range.

(e) For the purpose of reports required under § 60.7(c), periods of excess emissions that shall be reported are defined as all 6-minute periods during which the average opacity of the plume from any phosphate rock dryer, calciner, or grinder subject to paragraph (a) of this section exceeds the applicable opacity limit.

(f) Any owner or operator subject to the requirements under paragraph (c) of this section shall report for each calendar quarter all measurement results that are less than 90 percent of the average levels maintained during the most recent performance test conducted under § 60.8 in which the affected facility demonstrated compliance with the standard under § 60.402.

(Sec. 114, Clean Air Act as amended (42 U.S.C. 7414))

§ 60.404 Test methods and procedures.

(a) Reference methods in Appendix A of this part, except as provided under § 60.8(b), shall be used to determine compliance with § 60.402 as follows:

(1) Method 5 for the measurement of particulate matter and associated moisture content,

(2) Method 1 for sample and velocity traverses,

(3) Method 2 for velocity and volumetric flow rates,

(4) Method 3 for gas analysis, and

(5) Method 9 for the measurement of the opacity of emissions.

(b) For Method 5, the sampling time for each run shall be at least 60 minutes and have a minimum sampled volume of 0.84 dscm (30 dscf). However, shorter sampling times and smaller sample volumes, when necessitated by process variables or other factors, may be approved by the Administrator.

(c) For each run, the average phosphate rock feed rate in megagrams per hour shall be determined using a device meeting the requirements of § 60.403(d).

(d) For each run, emissions expressed in kilograms per megagram of phosphate rock feed shall be determined using the following equation:

$$E = \frac{[CsQs]10^{-6}}{M}$$

where, E = Emissions of particulates in kg/Mg of phosphate rock feed.

Cs = Concentration of particulates in mg/dscm as measured by Method 5.

Qs = Volumetric flow rate in dscm/hr as determined by Method 2.

10^{-6} = Conversion factor for milligrams to kilograms.

M = Average phosphate rock feed rate in mg/hr.

Note.—The reporting and recordkeeping requirements in this section are not subject to Section 3507 of the Paperwork Reduction Act of 1980, 44 U.S.C. 3507, because these requirements are expected to apply to fewer than 10 persons by 1985.

(Sec. 114, Clean Air Act, as amended, (42 U.S.C. 7414))

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