connected with removal and restoration of the site. The revision made by the proposed rulemaking is adopted without change by the final rulemaking.

The principal author of this final rulemaking is Leon Kabat, Division of Rights-of-Way, assisted by the staff of the Office of Legislation and Regulatory Management, Bureau of Land Management.

The Department of the Interior has determined that this document is not a major rule under Executive Order 12291 and will not have a significant economic impact on a substantial number of small entities under the Regulatory Flexibility Act (5 U.S.C. 601 et seq.).

The changes made by this final rulemaking are applicable to all entities who apply for a right-of-way grant or temporary use permit on the public lands. The changes made by the final rulemaking will reduce the regulatory burden on all entities, regardless of size.

The information collection requirements contained in 43 CRF Part 2880 have been approved by the Office of Management and Budget under 44 U.S.C. 3507 and assigned clearance number 1004- ———.

List of Subjects in 43 CFR Part 2880

Administrative practice and procedure, Common carriers, Oil and gas industry, Pipelines, Public lands—rights-of-way.

Under the authority of section 28 of the Mineral Leasing Act of 1920, as amended (30 U.S.C. 185), Part 2880, Group 2800, Subchapter B, Chapter II of Title 43 of the Code of Federal Regulations is amended as set forth below.

Dated: August 12, 1982.

Garrey E. Carruthers,

Assistant Secretary of the Interior.

PART 2880—RIGHTS-OF-WAY UNDER THE MINERAL LEASING ACT

1. Paragraph (c) of § 2882.1 is revised to read as follows:

§ 2882.1 [Amended]

* * * * *

(c) No right-of-way applications processing work, other than that incurred in the processing of applications for permits for temporary use of public lands in furtherance of the filing of an application and preapplication guidance under paragraph (b) of this section, shall be undertaken by the authorized officer prior to the filing of an application together with an advance payment as required by § 2803.1–1 of this title. Such processing work includes, but is not limited to, special studies such as environmental analyses, environmental impact statements, engineering surveys, resource inventories and detailed land use or record analyses.

* * * * *

2. Section 2883.1–2 is revised to read:

§ 2883.1–2 Rental payments.

Holders of right-of-way grants and temporary use permits issued under this part shall make rental payments in accordance with § 2803.1–2 of this title, except that the provisions of § 2803.1–2(c) of this title shall not apply.

§ 2883.6–1 [Amended]

3. Section 2883.6–1(a)(1) is amended by removing the phrase "is unwilling, unable or".

4. Section 2883.7 is revised to read:

§ 2883.7 Change in Federal jurisdiction or disposal of lands.

(a) Where a right-of-way grant or temporary use permit administered under these regulations traverses Federal lands that are transferred to another Federal agency, administration of the right-of-way shall, at the discretion of the authorized officer, be assigned to the acquiring agency unless such assignment would diminish the rights of the holder.

(b) Where a right-of-way grant or temporary use permit traverses Federal lands that are transferred out of Federal ownership, the transfer of the lands shall, at the discretion of the authorized officer, either include an assignment of the right-of-way, or be made subject to the right-of-way or the United States may reserve unto itself the lands encumbered by the right-of-way.

5. Section 2883.8 is revised to read:

§ 2883.8 Restoration of Federal lands.

Within a reasonable time after termination, revocation or cancellation of a right-of-way grant, the holder shall, unless directed otherwise in writing by the authorized officer, remove such structures and improvements and restore the site to a condition satisfactory to the authorized officer. If the holder fails to remove all such structures and improvements within a reasonable period, as determined by the authorized officer, they shall become the property of the United States, but the holder shall remain liable for the cost of removal of the structures and improvements and for restoration of the site.

[FR Doc. 82-24139 Filed 9-1-82; 8:45 am]

BILLING CODE 4310-84-M

federal register

Thursday
September 2, 1982

Part V

Environmental Protection Agency

Textile Mill Point Source Category Effluent Guidelines, Pretreatment Standards and New Source Performance Standards

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 410

[WH-FRL 2181-3]

Textile Mills Point Source Category Effluent Limitations Guidelines, Pretreatment Standards and New Source Performance Standards

AGENCY: Environmental Protection Agency.

ACTION: Final rule.

SUMMARY: This regulation limits the discharge of pollutants into navigable waters from existing and new sources where intermediate and finished textile products are manufactured from various types of fiber, yarn and fabric; it supersedes all existing regulations for the textile mills point source category, except the best practicable control technology currently available effluent limitations (promulgated July 5, 1974 (39 FR 24739)). The Clean Water Act and a Settlement Agreement between EPA and several environmental groups require EPA to issue this regulation.

The purpose of this regulation is to specify "best practicable technology" effluent limitations for certain subcategories, and "best available technology" effluent limitations and "new source performance standards" for the entire textile industry.

DATES: In accordance with 40 CFR 100.01 (45 FR 26048), this regulation will be considered issued for purposes of judicial review at 1:00 P.M. Eastern time on September 16, 1982. It will become effective October 18, 1982.

Under section 509(b)(1) of the Clean Water Act, any petition for judicial review of this regulation must be filed in the United States Court of Appeals within 90 days after the regulation is considered issued for purposes of judicial review. Under section 509(b)(2) of the Clean Water Act, the regulation may not be challenged later in civil or criminal proceedings brought by EPA to enforce its requirements.

ADDRESSES: Technical information may be obtained by writing to Richard E. Williams, Effluent Guidelines Division, (WH-552), EPA, 401 M Street, SW., Washington, D.C. 20460 or through calling (202) 426-2554. On September 16, 1982 copies of the development document and the economic analysis will be available for public review in EPA's Public Information Reference Unit, Room 2404 (Rear) (EPA Library), 401 M Street, SW., Washington, D.C. On November 8, 1982 the complete Record will be available for public review at the Public Information Reference Unit. The EPA information regulation (40 CFR Part 2) allows the Agency to charge a reasonable fee for copying. Copies of the development document and the economic analysis may also be obtained from the National Technical Information Service, Springfield, Virginia 22161 (703/487-6000). A notice will be published in the **Federal Register** announcing the availability of these documents from NTIS. (This should occur within 60 days of today's date.)

FOR FURTHER INFORMATION CONTACT: Richard E. Williams, (202) 426-2554.

SUPPLEMENTARY INFORMATION:

I. Legal Authority

This regulation is promulgated under the authority of Sections 301, 304, 306, 307, 308 and 501 of the Clean Water Act (the Federal Water Pollution Control Act Amendments of 1972, 33 U.S.C. 1251 *et seq.*, as amended by the Clean Water Act of 1977 (Pub. L. 95-217)), also called the "Act." It is also promulgated in response to the Settlement Agreement in *Natural Resources Defense Council, Inc.* v. *Train*, 8 ERC 2120 (D.D.C. 1976), *modified*, 12 ERC 1833 (D.D.C. 1979).

II. Scope of This Rulemaking

This regulation applies to the fiber preparation and manufacturing/processing parts of the textile industry which together make up the textile mills category (Standard Industrial Classification (SIC) Major Group 22). Textile apparel (SIC 23) is excluded here because plants in this group do not generate process wastewater.

Previously promulgated best available technology economically achievable (BAT) limitations, new source performance standards (NSPS), pretreatment standards for existing sources (PSES) and pretreatment standards for new sources (PSNS) are superseded by this regulation. The regulation promulgated today establishes effluent limitations and standards to control specific toxic, nonconventional and conventional pollutants for nine subcategories in the textile mills category: (1) Wool scouring, (2) wool finishing, (3) low water use processing, (4) woven fabric finishing, (5) knit fabric finishing, (6) carpet finishing, (7) stock and yarn finishing, (8) nonwoven manufacturing and (9) felted fabric finishing.

Best practicable control technology currently available (BPT) effluent limitations are established for the nonwoven manufacturing and the felted fabric finishing subcategories and for the water jet weaving subdivision of the low water use processing subcategory for which BPT effluent limitations guidelines have never been issued. The technology basis of BPT is biological treatment. These limitations control one toxic pollutant (total chromium), three nonconventional pollutants (COD, sulfide and total phenol) and three conventional pollutants (BOD_5, TSS and pH).

BAT limitations are established for all nine subcategories in the textile mills point source category. The technology basis of BAT is biological treatment. BAT limitations for the seven existing subcategories are equal to the previously promulgated BPT limitations. For the two new subcategories and for the water jet weaving subdivision of the low water use processing subcategory, BAT limitations are being established equal to the BPT limitations being promulgated today. These BAT limitations control one toxic pollutant, total chromium, and the nonconventional pollutants chemical oxygen demand (COD), sulfide and phenols (as measured by the procedures listed in 40 CFR Part 136).

NSPS are established for all subcategories and control one toxic pollutant (total chromium), three nonconventional pollutants (COD, sulfide and phenols), and three conventional pollutants [biochemical oxygen demand (BOD_5), total suspended solids (TSS) and pH]. NSPS are based on the median performance of the best biological treatment systems currently used to treat textile mill wastewaters.

Finally, this regulation does not establish categorical pretreatment standards for the control of toxic pollutants at existing or new source textile mills. Rather, the textile mills point source category is required to comply with General Pretreatment Regulations (40 CFR Part 403).

In this regulation, the Agency is not making substantive changes to the previously promulgated BPT limitations for Subparts A-G. For the sake of completeness, BPT limitations, which are in effect, are printed in this final rule. The only change is that a new format is being used. Because this is not a substantive change, BPT limitations for Subparts A-G are not subject to legal challenge.

III. Summary of Legal Background

The Federal Water Pollution Control Act Amendments of 1972 established a comprehensive program to "restore and maintain the chemical, physical and biological integrity of the Nation's waters" (Section 101(a)). To implement the Act, EPA was required to issue effluent limitations guidelines, pretreatment standards and new source performance standards for industrial dischargers.

The Act included a timetable for issuing these standards. However, EPA was unable to meet many of the deadlines and, as a result, in 1976, it was sued by several environmental groups. In settling this lawsuit, EPA and the plaintiffs executed a court-approved "Settlement Agreement." This Agreement required EPA to develop a program and adhere to a schedule in promulgating effluent limitations guidelines and pretreatment standards for 65 "priority" pollutants and classes of pollutants, for 21 major industries. [*See Natural Resources Defense Council, Inc.* v. *Train,* 8 ERC 2120 (D.D.C. 1976), *modified,* 12 ERC 1833 (D.D.C. 1979)].

Many of the basic elements of this Settlement Agreement were incorporated into the Clean Water Act of 1977 ("the Act"). Like the Settlement Agreement, the Act stressed control of the 65 classes of toxic pollutants. In addition, to strengthen the toxic control program, section 304(e) of the Act authorizes the Administrator to prescribe "best management practices" (BMP) to prevent the release of toxic and hazardous pollutants from plant site runoff, spillage or leaks, sludge or waste disposal and drainage from raw material storage associated with, or ancillary to, the manufacturing or treatment process.

Under the Act, the EPA program is to set a number of different kinds of effluent limitations. These are discussed in detail in the proposed regulation and development document. The following is a brief summary:

1. *Best Practicable Control Technology Currently Available (BPT).* BPT limitations generally are based on the average of the best existing performance at plants of various sizes, ages and unit processes within the industry or subcategory. In establishing BPT limitations, we consider the total cost of applying the technology in relation to the effluent reduction derived, the age of equipment and facilities involved, the process employed, the engineering aspects of the control technologies, process changes and nonwater-quality environmental impacts (including energy requirements). We balance the total cost of applying the technology against the effluent reduction.

2. *Best Available Technology Economically Achievable (BAT).* BAT limitations, in general, represent the best existing performance in the industrial subcategory or category. The Act establishes BAT as the principal national means of controlling the direct discharge of toxic and nonconventional pollutants to navigable waters. In arriving at BAT, the Agency considers the age of the equipment and facilities involved, the process employed, the engineering aspects of the control technologies, process changes, the cost of achieving such effluent reduction and nonwater-quality environmental impacts. The Administrator retains considerable discretion in assigning the weight to be accorded these factors.

3. *Best Conventional Pollutant Control Technology (BCT).* The 1977 Amendments added section 301(b)(2)(E) to the Act establishing "best conventional pollutant control technology" (BCT) for discharges of conventional pollutants from existing industrial point sources. Conventional pollutants are those defined in section 304(a)(4) (biological oxygen demanding pollutants (e.g., BOD*5*), total suspended solids (TSS), fecal coliform and pH) and any additional pollutants defined by the Administrator as "conventional," i.e., oil and grease. (See 44 FR 44501; July 30, 1979.)

BCT is not an additional limitation but replaces BAT for the control of conventional pollutants. In addition to other factors specified in section 304(b)(4)(B), the Act requires that BCT limitations be assessed in light of a two part "cost-reasonableness" test. *American Paper Institute* v. *EPA,* 660 F.2d 954 (4th Cir. 1981). The first test compares the cost for private industry to reduce its conventional pollutants with the cost to publicly owned treatment works (POTWs) for similar levels of reduction in their discharge of these pollutants. The second test examines the cost-effectiveness of additional industrial treatment beyond BPT. EPA must find that limitations are "reasonable" under both tests before establishing them as BCT. In no case may BCT be less stringent than BPT.

EPA published its methodology for carrying out the BCT analysis on August 29, 1979 (44 FR 50732). In the case mentioned above, the Court of Appeals ordered EPA to correct data errors underlying EPA's calculation of the first test, and to apply the second cost test. (EPA had argued that a second cost test was not required.)

EPA has determined that biological treatment, filtration and coagulation technologies are capable of removing significant amounts of conventional pollutants. However, EPA will soon propose a revised BCT methodology in response to the *American Paper Institute* v. *EPA* decision mentioned earlier. We will apply the new proposed BCT methodology to these technology options and will propose the appropriate BCT limitations for this industry shortly.

4. *New Source Performance Standards (NSPS).* NSPS are based on the best available demonstrated technology. New plants have the opportunity to install the best and most efficient production processes and wastewater treatment technologies.

5. *Pretreatment Standards for Existing Sources (PSES).* PSES are designed to control the discharge of pollutants that pass through, interfere with, or are otherwise incompatible with the operation of a publicly owned treatment works (POTW). They must be achieved within three years of promulgation. The Clean Water Act of 1977 requires pretreatment for pollutants that pass through the POTWs in amounts that would violate direct discharger effluent limitations or interfere with the POTW's treatment process or chosen sludge disposal method. The legislative history of the Act indicates that pretreatment standards are to be technology-based, analogous to the best available technology. EPA has generally determined that there is pass through of pollutants if the percent of pollutants removed by a well-operated POTW achieving secondary treatment is less than the percent removed by the BAT model treatment system. The general pretreatment regulations, which served as the framework for the categorical pretreatment regulations, are found at 40 CFR Part 403 (43 FR 27736 (June 26, 1978); 46 FR 9462 (January 28, 1981)).

6. *Pretreatment Standards for New Sources (PSNS).* Like PSES, PSNS control the discharge of pollutants to POTWs that pass through, interfere with, or are otherwise incompatible with the operation of POTWs. PSNS are issued at the same time as NSPS. New indirect dischargers, like new direct dischargers, have the opportunity to incorporate the best available demonstrated technologies. The Agency considers the same factors in promulgating PSNS as it considers in promulgating PSES.

IV. Methodology and Data Gathering Efforts

The methodology and data gathering efforts used in developing the proposed regulation were discussed in the preamble to the proposal, 44 FR 62207–62209 (October 29, 1979), and the notice of availability, 46 FR 8590, *et seq.* (January 27, 1981). In summary, before publishing the proposed regulation in 1979, the Agency conducted a data collection, analytical screening, and analytical verification program for the textile mills industry. This program stressed the acquisition of data on the presence and treatability of the 65 toxic pollutants and classes of toxic pollutants discussed previously. The 65 toxic pollutants and classes of pollutants potentially includes thousands of specific pollutants. EPA selected 129 specific toxic pollutants for study in this rulemaking and other industry rulemakings. (Analytical methods are discussed in *Sampling and Analysis Procedures for Screening of Industrial Effluents for Priority Pollutants* (U.S. E.P.A., April 1977)). Based on the results of that program, EPA identified several distinct treatment technologies, including both end-of-pipe and in-plant technologies, that are or can be used to treat textile industry wastewaters.

For each of these technologies, the Agency (i) compiled and analyzed historical and newly-generated data on effluent quality, (ii) identified its reliabilities and constraints, (iii) considered the nonwater quality impacts (including impacts on air quality, solid waste generation and energy requirements), and (iv) estimated the costs and economic impacts of applying it as a treatment and control system. Costs and economic impacts of the technology options considered are discussed in detail in *Economic Impact Analysis of Effluent Limitations and Standards for the Textile Mills Industry* (E.P.A. 440/2–82–001, August 1982). A more complete description of the Agency's study methodology, data gathering efforts and analytical procedures supporting the regulation can be found in the *Final Development Document for Effluent Limitations Guidelines New Source Performance Standards and Pretreatment Standards for the Textile Mills Point Source Category* (U.S. E.P.A., August 1982).

Subsequent to the October 1979 proposal, we reviewed all available information and found that additional data, especially daily monitoring data, were needed in order to determine accurately the performance of wastewater treatment systems. Therefore, EPA requested and received from ten mills daily results of treatment technology performance for the most recent full year of operation. All available data have been used to determine the capabilities of wastewater treatment systems applicable to textile wastewaters. EPA published a notice of availability of this additional information on January 27, 1981 (46 FR 8590) which resulted in some modifications to the proposed effluent limitations.

V. Changes From Proposal/Notice of Availability

The final regulation is significantly different from the proposed regulation. The changes are the result of the Agency's consideration of public comments provided in response to the proposal and the notice of availability, and further evaluation of the information upon which the proposal was based, the amounts of pollutants discharged at the BPT level of control, the treatability of the pollutants present in BPT effluents, the cost per pound of pollutant removed by the proposed BAT technology and the economic impact that would result from the implementation of proposed BAT limitations. Following are a review of the proposed regulation, a summary of the changes from proposal to promulgation and an explanation of the reasons for the changes.

A. Subcategorization

With two exceptions, the subcategorization scheme that formed the basis of the proposed regulations is identical to the subcategorization scheme in the current BPT regulations (40 CFR Part 410, Subparts A–G) promulgated in 1974. At proposal, the Agency proposed the establishment of two new subcategories, the nonwoven manufacturing subcategory (Subpart H) and the felted fabric processing subcategory (Subpart I). (See 44 FR 62204, October 29, 1979.) The nine subcategories of the promulgated regulations are the same as proposed.

In addition, the Agency proposed separate BAT limitations and NSPS for new subdivisions of the woven fabric finishing subcategory (Subpart D) (simple, complex and desizing operations) and the knit fabric finishing subcategory (Subpart E) (simple, complex and hosiery operations). (See 44 FR 62204, October 29, 1979.) Promulgated NSPS include separate limitations for these new subdivisions, but the promulgated BAT limitations do not. As stated previously and discussed in detail below, for these two subcategories the Agency is establishing BAT effluent limitations controlling toxic and nonconventional pollutants equal to the previously promulgated BPT limitations. BPT limitations were based on biological treatment and apply to all of the different operations employed in the woven fabric finishing and the knit fabric finishing subcategories, even though separate BPT limitations applicable to the specific new subdivisions were never established. BPT does include COD allowances to account for the higher COD raw waste loads typical of more complex operations in both subcategories. It is likely that costs would be incurred at some mills if BAT limitations required attainment of specific new limitations for the new subdivisions (simple, complex and desizing or hosiery operations) different from those specified in existing permits based on the BPT regulation. The Agency does not have sufficient information to determine the magnitude of these costs and, therefore, cannot assess the economic impact of establishing different limitations. Accordingly, other than those allowances included in the existing BPT regulation, this regulation does not establish separate BAT limitations for simple, complex and desizing operations in the woven fabric finishing subcategory or for simple, complex and hosiery operations in the knit fabric finishing subcategory.

Also, the Agency announced its intention to establish separate limitations for a new process, water jet weaving, in the low water use processing (formerly, dry processing) subcategory (Subpart C). (See 46 FR 9462; January 27, 1981.) The regulations promulgated today include separate limitations for the water jet weaving subdivision of the low water use processing subcategory.

B. Applicability

The Agency proposed to change the applicability of the regulations contained in Subparts A–F (compare 44 FR 62204 (October 29, 1979) and 39 FR 24739 (July 5, 1974)). Upon further consideration, regulations being promulgated today will continue the applicability reflected in Subparts A–F of the current BPT regulations. We have determined that continuation of the original applicability will facilitate the issuance of permits. Because of the general familiarity of affected parties with existing regulations, the administrative burden required of both premit applicants and permit-issuing officials will be greatly reduced through continuation of the original applicability.

C. Best Practicable Technology Limitations

In these regulations, EPA is promulgating BPT effluent limitations guidelines for the nonwoven manufacturing and the felted fabric processing subcategories and the water jet weaving subdivision of the low water use processing subcategory. EPA did not specifically propose BPT effluent limitations for these subcategories; we did propose BAT limitations and provided information on the pollutant removal effectiveness of biological treatment and multimedia filtration of biologically-treated effluents. For the reasons discussed below, we are establishing BPT effluent limitations based on biological treatment.

As discussed in the notice of availability, the raw waste characteristics of wastewaters discharged from mills in the nonwoven manufacturing subcategory and the felted fabric processing subcategory are substantially the same as those discharged from mills in the carpet finishing and wool finishing subcategories, respectively, (See 46 FR 8593; January 27, 1981.) BPT limitations for the nonwoven manufacturing and the felted fabric processing subcategories are based on transfer of the performance of biological treatment from the carpet finishing and wool finishing subcategories, respectively. The methodology used to develop BPT limitations is further discussed in Section VIII of the development document. In making the decision to base the BPT limitations for these two new subcategories on the performance of technology in two existing subcategories, the Agency determined that the technology, biological treatment, was clearly available and could be employed by the mills in the two new subcategories. It is also reasonable to predict that biological treatment will be capable of removing that increment of pollutants necessary to meet the new BPT limitations. This prediction is supported by the data on the performance of biological treatment in removing the same pollutants from mills in the carpet and wool finishing subcategories. A complete discussion of the Agency's consideration of the statutory factors for establishing BPT and the Agency's methodology are included in Section VIII of the development document.

The water jet weaving process is a recent technological development. In fact, sufficient data upon which effulent limitations and standards can be based are available from only two mills, both of which employ biological treatment. EPA is establishing BPT limitations for the water jet weaving subdivision of the low water use processing subcategory equal to the average performance levels being achieved at the two existing mills. A complete discussion of EPA's methodology in establishing this new BPT limitation is presented in Section VIII of the development document.

While these new BPT limitations are being established without formal proposal, the Agency has determined that there is good cause for promulgation without separate notice and comment. The new BPT limitations are based on the use of the same technology, biological treatment, as all of the existing BPT limitations.

Data on the preformance of biological treatment was included in the record of the proposal since biologial treatment alone was one option considered by the Agency in originally proposing BAT limitations. See 44 FR 62212. While the Agency elected to propose BAT limitations based on biological treatment plus the end-of-pipe controls, the public comments predominantly favored establishing limitations based upon the performance of biological treatment alone. The Agency believes that all commenters had an opportunity to present their views; it is unlikely that the comments would have differed fundamentally if the commenters had known that EPA would establish BPT and BAT limitations rather than only BAT limitations for the two new subcategories and new subdivision. Accordingly, it was unnecessary to provide separate opportunity for public comment.

D. Best Available Technology Limitations

The technology basis of the proposed BAT effluent limitations was biological treatment followed by multimedia filtration, except in the case of the wool scouring and wool finishing subcategories and the hosiery subdivisions of the knit fabric finishing subcategory where limitations were based on biological treatment, chemical coagulation and dissolved air flotation and the felted fabric processing subcategory where limitations were based on biological treatment. The proposed BAT effluent limitations would have controlled three toxic pollutants (total chromium, total copper and total zinc). Three nonconventional pollutants would have been controlled (chemical oxygen demand (COD), total phenols (as measured by the procedure listed in 40 CFR Part 136, *Standard Methods*) and color (as measured by the method developed by the American Dye Manufacturers Institute (ADMI) and described in the proceedings of the 28th Industrial Waste Conference, Purdue University)). One conventional pollutant (total suspended solids (TSS)) was proposed as an indicator for the control of toxic organic pollutants discharged from textile mills.

Comments received on the proposed regulations questioned the need for controls more stringent than existing BPT for these pollutants. The commenters stated that the level of control proposed for existing mills is too costly in relation to the effluent reduction benefits.

Since proposal, EPA has completed an analysis of all available data to determine the quantity of pollutants discharged by this industry, the treatability of pollutants present in BPT effluents, the cost per pound of pollutant removed by the proposed BAT technology and the economic impact that would result from the implementation of proposed BAT limitations.

EPA determined that the amount of toxic pollutants being discharged from the textile industry when BPT limitations are attained is less than 3.2 kg (7 lbs) per day per plant and that the total industry discharge is about 209 kkg (230 tons) per year. The total chromium being discharged is less than 1.2 kg (2.7 lbs) per day per plant. The Agency calculated that attainment of proposed BAT would result in costs of over $327 per pound equivalent of total toxics removed (1981 dollars). [A pound equivalent is calculated by multiplying the number of pounds of pollutant discharged by a weighting factor for that pollutant. The weighting factor is equal to the water quality criterion for a standard pollutant, copper, divided by the water quality criterion for the pollutant being evaluated). This cost is significantly higher than that for other industries for which BAT limitations have been established (e.g., iron and steel, inorganic chemicals). EPA has been unable to identify any reasonable, less costly technology option. In addition, EPA has estimated that attainment of proposed BAT limitations might cause the closure of nine mills and the unemployment of some 1800 workers. The Agency found that these closures might affect the local communities in which the mills are located because of the unavailability of alternative employment.

The proposed BAT limitations were aimed at controlling 15 organic toxic pollutants and 12 toxic metals. All the other toxic pollutants were excluded from regulation under Paragraph 8 of the modified Settlement Agreement (44 FR 62218, 62228–229; October 29, 1979). Since proposal, we have compared the concentrations of these 27 toxic pollutants present in textile industry wastewaters to the lowest concentration of each pollutant that can reasonably be achieved by the application of known technologies. (These lowest achievable concentrations are hereafter called "lowest theoretical treatability levels.") We also determined the degree and frequency that these lowest concentrations are exceeded. We found that of the 27 toxic pollutants of interest, 17 pollutants were found above lowest theoretical treatability levels in the raw waste only in a few isolated instances, six pollutants were found above lowest theoretical treatability levels in treated effluents only in a few isolated instances, two pollutants were detected at only a small number of sources and are uniquely related to those sources and one pollutant was not detectable with the use of state-of-the-art analytical methods because it is a common laboratory contaminant. The remaining pollutant, total chromium, is controlled by existing BPT effluent limitations. Establishment of BAT as proposed would result in only an estimated 10 percent reduction in the discharge of chromium (i.e., only 0.3 pounds per plant per day) at an estimated capital investment cost of approximately $78 million (First Quarter, 1982 dollars). The costs of additional removal of chromium and the potential economic impact do not justify further control.

In reviewing all available data and information, we found that (1) the amounts of toxic pollutants discharged at the BPT level of control are generally low, (2) the removal costs at the proposed BAT level of control are relatively high when compard to other industries, (3) toxic pollutants are found above the lowest achievable concentrations in only isolated instances, and (4) attainment of proposed BAT limitations might result in the closure of nine mills and the loss of 1800 jobs. Based on these findings, the Agency has determined that more stringent regulation of toxic pollutant discharges from the textile industry is not justified and that BAT effluent limitations should be established equal to BPT limitations. The Agency recently completed an environmental assessment in which we compared the predicted in-stream concentrations of toxic pollutants found in textile discharges after attainment of BPT and after attainment of proposed BAT effluent limitations with EPA's ambient water quality criteria. This analysis confirms our decision not to control toxics beyond a BPT level.

The Agency recognizes that the quantity of toxic pollutants discharged from individual mills may, in some cases, be higher than the industry average and may not be insignificant when viewed as a single point source discharge. As explained above and in the preamble to the proposed rule (44 FR 62204; October 29, 1979), several toxic pollutants have been found above minimum treatability levels in a few isolated instances. These include 1,2,4-trichlorobenzene, 2,4,6-trichlorophenol, toluene and tetrachloroethylene use as dye carriers and napthalene, pentachlorophenol and ethylbenzene used in the synthesis of dyes. Permit-issuing authorities may find it necessary to require representatives of individual mills to provide information on toxic pollutant usage, to analyze for specific toxic pollutants, and/or to conduct bioassay testing prior to issuing a NPDES permit. Permit-issuing authorities may limit specific pollutants on a case-by-case basis when limitations are necessary to carry out the purposes of the Act, even if the polluant is not controlled in this regulation (see Relationship to NPDES Permits).

EPA has also decided that the nonconventional pollutant color should be controlled on a case-by-case basis as dictated by water quality considerations, rather than through establishing uniform national standards. Color, in many instances, is an aesthetic pollutant, although in some instances color can interfere with sunlight transmission and the process of photosynthesis in the aquatic environment. Color is a mill-specific problem related to the combination of dyes and finishing chemicals used.

In addition, the Agency has found that the quantity of the nonconventional pollutants sulfide and total phenols now discharged by the textile industry are adequately controlled by existing BPT limits. Accordingly, more stringent BAT limitations are not needed. This is because of several factors including (a) substitution of sulfur dyes, (b) use of nonphenolic dye carriers and preservatives and (c) the effectiveness if biological treatment in removing these pollutants. EPA has not identified a technology option that is more effective than current industry practices. Therefore, EPA is incorporating existing BPT limitations for sulfide and total phenols in the BAT regulations promulgated today.

Furthermore, EPA has determined that it is not appropriate to establish more stringent COD limitations. Biological treatment is capable of removing on the order of 70 percent of the COD raw waste load typical of this industry. The technology on which proposed BAT limitations were based is relatively ineffective in reducing COD. (The application of multimedia filtration in addition to biological treatment increases COD removal to only about 75 percent.) The application of other technologies considered during development of the proposed rule [e.g., multimedia filtration (MMF) plus granular activated carbon (GAC), or chemical coagulation (CC), sedimentation (SED), MMF plus GAC] can be very effective in reducing COD discharges. However, these technologies have total annual costs as much as three to six times that of the proposed BAT. As discussed previously, EPA predicts that nine mills might close if required to attain proposed BAT limitations. The economic impact analysis predicted that the application of MMF plus GAC or the application of CC, SED, MMF plus GAC could result in the closure of 12 and 27 plants, respectively. Because the costs of application of more advanced technologies to control COD are high in relation to the effluent reduction benefits and because of a potential for adverse economic impact, the Agency has determined that COD should continue to be controlled at the BPT level.

For the reasons discussed above, EPA is establishing BAT limitations for toxic and nonconventional pollutants equal to the previously promulgated BPT limitations (for the seven existing subcategories) or equal to the BPT limitations promulgated today (for the two new subcategories and for the water jet weaving subdivision of the low water use processing subcategory). We expect that Federal and State permitting authorities will establish toxic and nonconventional pollutant limitations more stringent than the existing BPT, where needed, to account for unusal manufacturing or treatment circumstances or to achieve or maintain the receiving water quality.

E. New Source Performance Standards

The technology basis of proposed NSPS was biological treatment followed by chemical coagulation and multimedia filtration. The proposed NSPS would have controlled three toxic pollutants (total chromium, total copper and total zinc), three nonconventional pollutants (COD, total phenols and color) and three conventional pollutants (BOD_5, TSS and pH).

Promulgated NSPS are more stringent than BPT/BAT effluent limitations. The technology basis of promulgated NSPS is the best demonstrated biological treatment performance in the textile industry. As discussed previously, biological treatment (the technology basis of BPT effluent limitations) provides good control of the discharge of toxic pollutants and results in a significant reduction of nonconventional and conventional pollutants discharged textile mills. We have also determined that application of biological treatment at new sources will not change the rate of entry into the industry or slow the industry growth rate. Specific standards for this industry are generally based on the median discharge levels attained at existing best performers in each subcategory of the textile industry. This level of control represents the best demonstrated performance of existing biological treatment systems in this industry. The specific methodology used to calculate the final NSPS for each subcategory is discussed in detail in the development document.

F. Pretreatment Standards

The technology basis of proposed PSES was screening and equalization plus chemical coagulation/sedimentation. The proposed PSNS was based on segregation of waste streams followed by screening and equalization plus chemical coagulation/sedimentation and multimedia filtration. Proposed pretreatment standards would have controlled total chromium, total copper and total zinc.

Commenters on the proposed standards for indirect dischargers (PSES and PSNS) argued that when existing general pretreatment standards are met, textile wastewaters do not interfere with the operation of POTWs, including disposal of sludge, or pass through a POTW inadequately treated.

The Clean Water Act of 1977 requires pretreatment for pollutants that pass through POTWs in amounts that would violate direct discharger effluent limitations or interfere with the POTW's treatment process or chosen sludge disposal method. The legislative history of the 1977 Act indicates that pretreatment standards are to be technology-based, analogous to the best available technology. EPA has generally determined that there is pass through of pollutants if the percent of pollutants removed by a well-operated POTW achieving secondary treatment is less than the percent removed by the BAT model treatment system.

We have reviewed available information and have determined that textile wastewaters are susceptible to treatment in and do not interfere with the operation of POTWs. Comparison of metal removal efficiencies at 20 POTWs and at textile industry biological treatment systems shows that POTW removal of copper, chromium and zinc is equal to or better than removal in industry biological treatment systems. [*Fate of Priority Pollutants in Publicly Owned Treatment Works* (EPA 440/1-80-301, October 1980)]. Therefore, these pollutants do not pass through POTWs.

Accordingly, under the authority of Paragraph 8(b)(i) of the modified Settlement Agreement, this regulation does not establish categorical pretreatment standards for the textile industry. The textile industry will, however, remain subject to the General Pretreatment Regulations. The development document includes information on the capability of various pretreatment technologies in controlling textile industry discharges to POTWs. We expect that operators of POTWs will be able to control the discharge of specific pollutants, if required, on a case-by-case basis and could make use of the information contained in the development document that EPA will publish.

VI. Costs and Economic Impact

Executive Order 12291 requires EPA and other agencies to provide regulatory impact analyses for rules that result in an annual cost to the economy of 100 million dollars or more or that meet other economic impact criteria. In addition, the Clean Water Act specifies that best available technology limitations must be economically achievable. The Regulatory Flexibility Act requires EPA to consider the effects of certain rules on small entities, and if they are significant and affect a substantial number of small entities, to prepare a Regulatory Flexibility Analysis. The Agency does not consider this to be a major rule. Similarly, there will not be a significant impact on a substantial number of small entities and, therefore, a Regulatory Flexibility Analysis is not required.

As discussed above, EPA is making substantial changes to the regulations that were proposed in October 1979 (and modified in the January 1981 notice of availability). BPT limitations are established for the new nonwoven manufacturing and felted fabric processing subcategories and the water jet weaving subdivision of the low water use processing subcategory. These limitations are based on the performance of biological treatment, the same technology on which existing BPT limitations were established. For the two new subcategories and the new subdivision, investment costs are \$3.7 million; total annualized costs are \$1.9 million, including depreciation and interest (First quarter, 1982 dollars). These compliance costs are not projected to result in any plant closures or cause other significant economic impacts. The BAT limitations promulgated today for the remaining seven subcategories do not reflect any treatment requirements beyond biological treatment for existing direct dischargers. EPA is not establishing categorical pretreatment standards for existing indirect dischargers; these dischargers will only be subject to general pretreatment regulations already in effect for indirect dischargers (40 CFR Part 403). Accordingly, EPA expects no incremental costs or impacts for existing plants from this rulemaking. Additionally, NSPS are not expected to change the rate of entry into the industry or slow the industry growth rate.

In developing this rule, the Agency considered various technology options and analyzed their economic impacts. This analysis is presented in *Economic Impact Analysis of Effluent Limitations and Standards for the Textiles Mills Industry* (E.P.A. 440/2-82-001, August 1982). For each of the options considered during rulemaking, this analysis details the investment and annual costs for the industry as a whole and for typical plants; assesses the impact of effluent control in terms of price and production changes, plant closures and employment effects; and assesses the potential impacts on the small plants in this industry.

EPA also considered cost-effectiveness in developing the final regulation. The results of EPA's analysis are detailed in a separate report, "Cost Effectiveness Analysis for Effluent Limitations and Standards in the Textile Mills Industry," which is included in the Record.

VII. Nonwater Quality Environmental Impacts

Sections 304(b) and 306 of the Act require EPA to consider the nonwater quality environmental impacts (including energy requirements) of certain regulations. Because this regulation does not impose any additional pollution control requirements on existing sources, implementation will not result in any substantial increase in air pollution, energy use or solid waste generation.

VIII. Pollutants and Subcategories Not Regulated

Paragraph 8 of the modified Settlement Agreement, approved by the District Court for the District of Columbia on March 9, 1979 (12 ERC 1833), contains provisions authorizing the exclusion from regulation, in certain circumstances, of toxic pollutants and industry categories and subcategories.

A. Exclusion of Pollutants

On December 18, 1980, EPA submitted an affidavit explaining that the Agency decided not to regulate 102 of the 129 toxic pollutants under the authority of Paragraph 8(a)(iii) of the modified Settlement Agreement. Of those 102 pollutants, 65 were excluded from regulation because "they are not detectable by Section 304(h) analytical methods or other state-of-the-art methods," 22 were excluded from regulation because "they are detected at only a small number of sources within a subcategory and are uniquely related to those sources," and 15 were excluded from regulation because "they are present only in trace amounts and neither cause nor are likely to cause toxic effects."

We have completed our analysis of the amount and frequency of occurrence of specific toxic pollutants not previously excluded from regulation. We are excluding all remaining pollutants, with the exception of total chromium, under the authority of Paragraph 8(a)(iii). The pollutants and the specific reasons for their exclusion are presented in Appendix B.

The pollutant total chromium was controlled under the original BPT; because BAT is being promulgated equal to BPT, total chromium is controlled.

B. Exclusion of Subcategories

On May 10, 1979, the Agency submitted an affidavit excluding from regulation the apparel manufacturing, padding and upholstery filling and cordage and twine portions of the textile industry under the authority of Paragraph 8(a)(iv) because the amount and toxicity of each pollutant in the discharges do not justify the development of national regulations. This affidavit also explained that the low water use processing subcategory, for which BPT had been established, would be excluded from further regulation development, also under authority of Paragraph 8(a)(iv). Subsequently, however, the Agency decided to establish a separate subdivision and new BPT limitations for the new water jet weaving process in the low water use processing subcategory. (See 46 FR 9462; January 27, 1981.) The water jet weaving subdivision is included in the low water use processing subcategory because the wastewater discharges from the water jet weaving process are similar to those discharged in the low water use processing subcategory. The new limitations allow the discharge of higher levels of BOD, TSS and COD than current low water use processing limitations because of the greater water usage in the water jet weaving process.

In addition, under the authority of Paragraph 8(b)(i), this regulation does not establish categorical pretreatment standards for existing and new sources in the textile mills point source category. We have found that textile wastewaters are susceptible to treatment in and do not interfere with or pass through publicly owned treatment works.

IX. Best Management Practices

Section 304(e) of the Clean Water Act gives the Administrator authority to prescribe "best management practices" (BMPs). EPA, through its Office of Water Enforcement, is offering guidance to permit authorities in establishing BMPs required by unique circumstances for a given plant. BMPs are not addressed in this regulation.

X. Upset and Bypass Provisions

A recurring issue is whether industry guidelines should include provisions authorizing noncompliance with effluent limitations during periods of "upset" or "bypass." An upset, sometimes called an "excursion," is an unintentional noncompliance occurring for reasons beyond the reasonable control of the permittee. It has been argued that an upset provision in EPA's effluent limitations is necessary because such upsets will inevitably occur even in properly operated control equipment. Because technology-based limitations require only what technology can achieve, it is claimed that liability for such situations is improper. When confronted with this issue, courts have disagreed on whether an explicit upset or excursion exemption is necessary, or whether upset or excursion incidents may be handled through EPA's exercise of enforcement discretion. Compare *Marathon Oil Co.* v. *EPA*, 564 F. 2d 1253 (9th Cir. 1977) with *Weyerhaeuser* v. *Costle*, 590 F. 2d 1011 (D.C. Cir. 1978) and *Corn Refiners Assn., et al.* v. *Costle*, 594 F. 2d 1223 (8th Cir. 1979). [See also *American Petroleum Institute* v. *EPA*, 540 F. 2d 1023 (10th Cir. 1976); *CPC International, Inc.* v. *Train*, 540 F. 2d 1320 (8th Cir. 1976); *FMC Corp.* v. *Train*, 539 F. 2d 973 (4th Cir. 1976).]

An upset is an unintentional episode during which effluent limits are exceeded; a bypass, however, is an act of intentional noncompliance during which waste treatment facilities are circumvented in emergency situations. We have, in the past, included bypass provisions in NPDES permits.

We determined that both upset and bypass provisions should be included in NPDES permits and have promulgated Consolidated Permit Regulations that include upset and bypass provisions. (See 40 CFR 122.60, 45 FR 33290 (May 19, 1980).) The upset provision establishes an upset as an affirmative defense to prosecution for violation of technology-based effluent limitations. The bypass provision authorizes bypassing to prevent loss of life, personal injury, or severe property damage. Consequently, although permittees in the textile mills industry will be entitled to upset and bypass provisions in NPDES permits, this final regulation does not address these issues.

XI. Variances and Modifications

Upon the promulgation of this regulation, the effluent limitations for the appropriate subcategory must be applied in all Federal and State NPDES permits thereafter issued to direct dischargers in the textile industry. For the BPT effluent limitations, the only exception to the binding limitations is EPA's "fundamentally different factors" variance. [See *E.I. du Pont de Nemours & Co.* v. *Train*, 430 U.S. 112 (1977); *Weyerhaeuser Co.* v. *Costle, supra.*] This variance recognizes factors concerning a particular discharger that are fundamentally different from the factors considered in this rulemaking. Although this variance clause was set forth in EPA's 1973–1976 industry regulations, it is now included in the NPDES regulations and will not be included in the textile or other industry regulations. (See the NPDES regulations at 40 CFR Part 125, Subpart D.)

The BAT limitations in this regulation are also subject to EPA's "fundamentally different factors" variance. BAT limitations for nonconventional pollutants are subject to modifications under Sections 301(c) and 301(g) of the Act. These statutory modifications do not apply to toxic or conventional pollutants. To apply for these modifications a discharger must be in compliance with BPT. Because this rule will make BAT equal to BPT, EPA does not expect any applications for section 301(c) or 301(g) modifications. [See 43 FR 40895 (September 13, 1978).]

NSPS are not subject to EPA's "fundamentally different factors" variance or any statutory or regulatory modifications. (See *E. I. du Pont de Nemours and Co.* v. *Train*, supra.)

XII. Relationship to NPDES Permits

The BPT and BAT limitations and NSPS in this regulation will be applied to individual textile mills through NPDES permits issued by EPA or approved State agencies, under section 402 of the Act. As discussed in the preceding section of this preamble, these limitations must be applied in all Federal and State NPDES permits except to the extent that variances and modifications are expressly authorized.

Other aspects of the interaction between these limitations and NPDES permits are discussed below.

One issue that warrants consideration is the effect of this regulation on the powers of NPDES permit-issuing authorities. The promulgation of this regulation does not restrict the power of any permitting authority to act in any manner consistent with law or these or any other EPA regulations, guidelines, or policy. For example, even if this regulation does not control a particular pollutant, the permit-issuer may still limit such pollutant on a case-by-case basis when limitations are necessary to carry out the purposes of the Act. Where manufacturing practices or treatment circumstances warrant additional controls, such limitations may be technology-based in conformance with the legislative history of the Act. However, such limitations are subject to administrative and judicial review as part of the permit issuance process. In addition, to the extent that State water quality standards or other provisions of State or Federal law require limitation of pollutants not covered by this regulation (or require more stringent limitations on covered pollutants), such limitations must be applied by the permit-issuing authority.

A second topic that warrants discussion is the operation of EPA's NPDES enforcement program, many aspects of which were considered in developing this regulation. We emphasize that although the Clean Water Act is a strict liability statute, the initiation of enforcement proceedings by EPA is discretionary. We have exercised and intend to exercise that discretion in a manner that recognizes and promotes good-faith compliance efforts and conserves enforcement resources for those who fail to make good-faith efforts to comply with the Act.

XIII. Public Participation and Summary of the Major Issues

Numerous agencies and groups participated during this study of the textile mills point source category. The Agency solicited public comment on the proposed rules and the notice of availability of additional information published in the **Federal Register** on October 29, 1979, and January 27, 1981, respectively. In addition, the Agency accepted public comment on the development document and economic analysis supporting the proposed rules. The Agency received one hundred and twenty comment submittals. Also, on February 15, 1980, in Washington, D.C., the Agency held a public hearing on the proposed regulations for the textile industry.

Individual public comments received on the proposed regulation, and our responses, are presented in a report, "Responses to Public Comments, Proposed Textile Industry Effluent Guidelines and Standards," August 1982, which is part of the public record for this regulation. A summary of the major comments and the Agency's responses follow.

1. *Comment:* Toxic pollutants are not present in textile wastewaters in significant amounts, the proposed BAT limits are not cost beneficial and further control beyond existing BPT is not warranted.

Response: The Clean Water Act (Pub. L. 95–217) and the Settlement Agreement require the Agency to establish technology-based effluent limitations and standards for each of 21 industrial categories, including the textile mills point source category. However, as discussed previously, Paragraph 8 of the Settlement Agreement authorizes the Administrator to exclude subcategories or pollutants from regulation under certain conditions where development of national regulations is not justified. Since proposal, we have reconsidered the total amount of toxic pollutants discharged from the textile industry when BPT is attained, the cost per pound of toxic pollutants removed at proposed BAT, the treatability of toxic pollutants that remain in textile discharges after application of biological treatment and the economic impact that would result from the implementation of proposed BAT limitations. In reviewing all available data, we have concluded that further regulation of the textile industry is not warranted. Therefore, we are establishing BAT limitations equal to previously promulgated BPT limitations.

2. *Comment:* The low levels of metals present in textile wastewaters do not interfere with the operation of publicly owned treatment works (POTWs) or the use and disposal of POTW sludge. Therefore, categorical pretreatment standards are unnecessary.

Response: We are unaware of any documented instance of POTW interference because of the impact of toxic or nonconventional pollutant discharges from textile mills. While the potential exists for interference in individual cases where little dilution occurs, these interference problems, should they exist, are more appropriately handled at the local level. We have also determined that textile wastewaters are susceptible to treatment in POTWs and that toxic pollutants found in mill discharges are unlikely to pass through POTWs. Therefore, there is no need to establish categorical pretreatment standards for this industry. The indirect dischargers are, however, subject to the General Pretreatment Regulations (40 CFR Part 403).

3. *Comment:* The proposed NSPS, based on the application of coagulation and filtration of biologically-treated effluent, are too stringent; NSPS should be based on the same technology as proposed BAT (biological treatment plus filtration).

Response: NSPS are being promulgated based on the application of biological treatment, rather than more advanced technology (i.e., filtration or chemical coagulation). Biological treatment provides adequate control of the discharge of toxic pollutants and results in a significant reduction of nonconventional and conventional pollutants. Application of this technology level will not change the rate of entry into the industry or slow the industry growth rate. Promulgated NSPS are more stringent than BPT effluent limitations. Specific standards are generally based on the median discharge levels attained at existing best performers in each subcategory of the textile industry. This level of control represents the best demonstrated performance of existing biological treatment systems in this industry.

4. *Comment:* The Agency did not have sufficient information and data available to support the proposed effluent limitations and standards.

Response: Proposed limitations were based on all information available to the Agency prior to proposal. The Agency reviewed the information from previous studies of the industry, the Census of Manufactures and the industry's commercial directory. We requested detailed information on about 1150 mills, including 600 low water use processing facilities. EPA and its contractors conducted visits, sampled fifty mills and participated in numerous meetings with individuals and industry committees. The Agency actively solicited industry comments and suggestions over the course of this study. Our approach has assured the availability of sufficient information on the performance of treatment technologies and the presence of toxic pollutants to enable the Agency to make sound regulatory decisions. The development document supporting these rules includes a comprehensive description of the information used to develop the limitations and standards and to support our decision that no further regulation of the textile industry is warranted. All available information and data are included in the record and are available for review by interested parties.

5. *Comment:* The technologies identified as the basis of the proposed BAT limitations cannot achieve and maintain this level of control.

Response: Proposed BAT limitations were based on the Agency's evaluation of all available treatment performance data, both full-scale and pilot-scale, including the results of the EPA/Industry BATEA Pilot Plant Research Project. Our methodology assumed that mills were already achieving BPT, since existing plants were required to comply with BPT by July 1, 1977. The results of our analysis of all available treatment performance data indicated that the technologies on which proposed BAT limitations were based were capable of effectively controlling pollutants discharged in textile wastewaters to the levels specified in the proposed rules or as modified in the notice of availability of additional information.

6. *Comment:* A definite relationship has not been established between TSS and toxic organic pollutants. Therefore, the use of TSS as an indicator for the presence of toxic organic pollutants is inappropriate. In addition, TSS violations are likely to result from normal variations in treatment system performance that have no relation to the discharge of toxic pollutants.

Response: At proposal, the Agency was aware that filtration of biologically-treated textile wastewaters reduces the amount of toxic organic pollutants discharged. Therefore, by removing additional quantities of TSS, toxic organic pollutants would also be removed. The proposed use of an indicator was intended to obviate the expensive analytical procedures for measuring toxic organic pollutants present in textile wastewaters. Since proposal, as discussed previously, the Agency has decided not to impose specific controls on the discharge of toxic organic pollutants or to require attainment of BAT limitations for an indicator pollutant (i.e., TSS). Therefore, this comment and many others both favoring or opposing the use of TSS as an indicator pollutant are no longer germane.

7. *Comment:* All color limitations should be eliminated from the final regulation. Problems related to color discharged by the textile industry should be handled on a case-by-case basis by local authorities.

Response: The Agency has decided not to establish either BAT effluent limitations or NSPS for color. The decision is based on an evaluation of color discharged by the textile industry in terms of its national significance. Color, in many instances, is simply an aesthetic pollutant. In some cases, it has been shown that color can interfere with the transmission of sunlight and the process of photosynthesis in the aquatic environment. In the textile industry, color is a mill-specific problem related o the combination of dyes and finishing chemicals used. For this reason, EPA feels that color should be controlled on a case-by-case basis by local authorities as dictated by water quality considerations.

8. *Comment:* An industry-sponsored economic analysis shows that the impacts of the proposed rules are considerably greater than those indicated by the Agency's economic impact analysis.

Response: We have carefully reviewed the industry's analysis. We have determined that the differences in conclusions between the industry-sponsored analysis and the Agency's economic impact analysis are mainly attributable to (1) higher compliance cost estimates in the industry's analysis, and (2) the aggregation scheme used to project impacts for the total industry from a sample of plants. The estimated compliance costs of attaining proposed BAT limitations in the industry's analysis, when aggregated to the total industry, were nearly five times higher than the Agency's estimates. This is due, in part, to a more limited data base, the cost estimation procedure, and including the costs of achieving both BPT and proposed BAT levels of control. The Agency's analysis is based on a larger data base, and uses a model plant analysis that accounts for the number and size distribution of plants in each subcategory. In addition, the Agency's analysis does not include the costs of achieving the BPT level of control because BPT was already to have been achieved by July 1977. The aggregation scheme in the industry's analysis is a simple extrapolation that overestimated the size of the industry by using a data base that is biased toward large plants. These differences in compliance costs and in methodology result in higher projections of plant closures and unemployment impacts in the industry's analysis. The Agency's analysis is based on a more representative data base, and the methodological assumptions are better supported by financial information about the industry. Thus, we believe the Agency's analysis presents an accurate assessment of the impacts of achieving the proposed BAT level of control.

9. *Comment:* If production processes employed at an individual mill are characteristic of more than one subcategory, the allowable discharge of pollutants should be determined by proration. Proration provides a more equitable method for determining allowable discharge levels than basing the total allowable discharge on the predominant operation.

Response: The development document supporting the 1974 BPT limitations includes the recommendation that allowable discharge levels be established by proration. Therefore, we recommend that this practice continue in the development of BAT permits because BAT limitations are being established equal to BPT. NSPS are based on the best performance of existing biological treatment systems applied within each specific subcategory. We encourage new source permits to be established by proration. Therefore, if more than one production process is employed at a new source direct discharger, the total allowable discharge should be determined by multiplying the production associated with each subcategory by the appropriate standard for each subcategory.

10. *Comment:* Promulgated standards should allow an additional discharge allowance if at least fifty percent of a facility's production is commission finishing.

Response: Since proposal, the Agency has reviewed available data to determine the need for an additional allowance for mills where commission finishing is practiced. The results show that raw waste characteristics for commission finishers are not substantially different than for other mills. In fact, in some subcategories, raw waste loadings for commission finishers are lower than for some other mills where commission finishing is not employed. Therefore, the Agency is not providing an allowance for commission finishing in promulgated NSPS.

Current BPT limitations allow an additional discharge allowance for commission finishing. The Agency has not investigated the economic impact on existing mills of the elimination of the commission finishing allowance. Because the Agency is establishing BAT limitations equal to BPT limitations for the textile industry, the Agency has decided that existing dischargers shall still be entitled to this allowance.

11. *Comment:* The low water use processing subcategory is very broad. The information presented in the proposed development document fails to assess adequately all processes, particularly in the areas of functional finishing and fabric coating. Allowances should be made for greige mills having

more than simple rinse water discharges.

Response: The low water use subcategory is established to include textile mills that engage in textile processing operations where process water volume requirements are minimal. Examples include production of greige goods, laminating or coating fabrics and tire cord fabric; texturizing of yarn; and tufting or backing of carpet. Wastewaters discharged from plants in this subcategory are primarily composed of nonprocess waters from lavatories and food preparation/consumption areas, boiler blowdown and noncontact cooling water. The process related wastewater is usually less then 20 percent of the total discharge volume. In cases where a portion of a mill's production is in the low water use subcategory and a portion is in another subcategory, e.g., woven fabric—complex manufacturing operations, the total allowable discharge of regulated pollutants should be calculated by prorating the production between the appropriate subcategories.

We have developed limitations for the water jet weaving segment of the low water use processing subcategory. Water jet weaving is a relatively new weaving technology; it is included as a subdivision of the low water use processing subcategory because it is used to produce greige goods. Water jet weaving generates more wastewater per unit of production than other low water use operations and separate limitations have been developed to account for this difference.

XIV. Small Business Administration (SBA) Financial Assistance

The Agency is continuing to encourage small manufacturers to use Small Business Administration (SBA) financing as needed for pollution control equipment. Three basic programs are in effect: the Guaranteed Pollution Control Program, the Section 503 Program, and the Regular Guarantee Program. All the SBA loan programs are only open to businesses with net assets less than $6 million, with an average annual after-tax income of less than $2 million and with fewer than 250 employees.

The guaranteed pollution control program authorizes the SBA to guarantee the payments on qualified contracts entered into by eligible small businesses to acquire needed pollution control facilities when the financing is provided through pollution control bonds, bank loans and debentures. Financing with SBA's guarantee of payment makes available long-term financing comparable with market rates. The program applies to projects that cost from $150,000 to $200,000.

The Section 503 Program, as amended in July 1980, allows for long-term loans to small and medium-sized businesses. These loans are made by SBA-approved local development companies, which for the first time are authorized to issue Government-backed debentures that are bought by the Federal Financing Bank, an arm of the U.S. Treasury.

Through SBA's Regular Guarantee Program, loans are made available by commercial banks and are guaranteed by the SBA. This program has interest rates equivalent to market rates.

For additional information on the Regular Guarantee and Section 503 Programs contact your district or local SBA Office. The SBA coordinator at EPA headquarters is Ms. Frances Desselle who may be reached at (202) 426-7874.

For further information and specifics on the Guaranteed Pollution Control Program contact:

U.S. Small Business Administration, Office of Pollution Control Financing, 4040 North Fairfax Drive, Rosslyn, Virginia 22203, (703) 235-2902

XV. List of Subjects in 40 CFR Part 410

Textiles, Water pollution control, Waste treatment and disposal.

XVI. OMB Review

The regulation was submitted to the Office of Management and Budget for review as required by Executive Order 12291. This is not a major regulation as required by E.O. 12291.

Dated: August 27, 1982.

John W. Hernandez,

Acting Administrator.

Appendix A—Abbreviations, Acronyms and Other Terms Used in This Notice

Agency—The U.S. Environmental Protection Agency

BAT—The best available technology economically achievable, under section 301(b)(2)(A) of the Act

BCT—The best conventional pollutant control technology, under section 301(b)(2)(E) of the Act

BMPs—Best management practices, under section 304(e) of the Act

BPT—The best practicable control technology currently available, under section 301(b)(1)(A) of the Act

Clean Water Act—The Federal Water Pollution Control Act Amendments of 1972 (33 U.S.C. 1251 *et seq.*), as amended by the Clean Water Act of 1977 (Pub. L. 95-217)

Direct discharger—A facility where wastewaters are discharged or may be discharged into waters of the United States

Indirect discharger—A facility where wastewaters are discharged or may be discharged into a publicly owned treatment works

NPDES permit—A National Pollutant Discharge Elimination System permit issued under section 402 of the Act

NSPS—New source performance standards under section 306 of the Act

POTW (POTWs)—Publicly owned treatment works

PSES—Pretreatment standards for existing sources of indirect discharges, under section 307(b) of the Act

PSNS—Pretreatment standards for new sources of indirect discharges, under section 307(c) of the Act

RCRA—Resource Conservation and Recovery Act of 1976 (Pub. L. 94-580), Amendments to Solid Waste Disposal Act

The Act—The Clean Water Act of 1977

Appendix B—Toxic Pollutants Excluded

(1) Toxic pollutants present in trace amounts too small to be effectively reduced by the technologies known to the Administrator:

2,4,6-trichlorophenol	Copper
Chloroform	Cyanide
1,2,4-trichlorobenzene	Lead
1,2-dichlorobenzene	Mercury
Pentachlorophenol	Nickel
Parachlorometacresol	Selenium
Tetrachloroethylene	Silver
Arsenic	Zinc
Cadmium	

(2) Toxic pollutants detected at only a small number of sources within a subcategory and uniquely related to those sources:

Acrylonitrile	Antimony

(3) Toxic pollutants effectively controlled by the technologies on which other effluent limitations and standards are based:

Benzene	Naphthalene
Trichloroethylene	Phenol
Ethylbenzene	Toluene

(4) Toxic pollutant not detectable with the use of analytical methods approved pursuant to section 304(h) of the Act:

Bis(2-ethylhexyl)phthalate

Part 410 of Title 40 is revised to read as follows:

PART 410—TEXTILE MILLS POINT SOURCE CATEGORY

General Provisions

Authority: Secs. 301, 304(b), (c), (e), and (g), 306(b) and (c), 307(b) and (c), and 501 of the Clean Water Act (the Federal Water Pollution Control Act Amendments of 1972, as amended by the Clean Water Act of 1977) (the "Act"); 33 United States C. 1311, 1314(b), (c), (e), and (g), 1316(b) and (c), 1317(b) and (c), and 1361; 86 Stat. 186 et seq., Pub. L. 92-500; 91 Stat. 1567, Pub. L. 95-217.

General Provisions

§ 410.00 Applicability.

This part applies to any textile mill or textile processing facility which discharges or may discharge process wastewater pollutants to the waters of the United States, or which introduces or may introduce process wastewater pollutants into a publicly owned treatment works.

§ 410.01 General definitions.

In addition to the definitions set forth in 40 CFR Part 401, the following definitions apply to this part:

(a) "Sulfide" shall mean total sulfide (dissolved and acid soluble) as measured by the procedures listed in 40 CFR Part 136.

(b) "Phenols" shall mean total phenols as measured by the procedure listed in 40 CFR Part 136.

(c) Total Chromium shall mean hexavalent and trivalent chromium as measured by the procedures listed in 40 CFR Part 136.

(d) The term "commission finishing" shall mean the finishing of textile materials, 50 percent or more of which are owned by others, in mills that are 51 percent or more independent (i.e., only a minority ownership by company(ies) with greige or integrated operations); the mills must process 20 percent or more of their commissioned production through batch, noncontinuous processing operations with 50 percent or more of their commissioned orders processed in 5000 yard or smaller lots.

(e) The term "product," except where a specialized definition is included in the subpart, shall mean the final material produced or processed at the mill.

§ 410.02 Monitoring requirements. [Reserved]

Subpart A—Wool Scouring Subcategory

§ 410.10 Applicability; description of the wool scouring subcategory.

The provisions of this subpart are applicable to process wastewater discharges resulting from the following types of textile mills: wool scouring, topmaking, and general cleaning of raw wool.

§ 410.11 Specialized definitions.

In addition to the definitions set forth in 40 CFR Part 401 and § 410.01 of this Part, the following definitions apply to this subpart:

(a) The term "wool" shall mean the dry raw wool as it is received by the wool scouring mill.

(b) The term "oil and grease" shall mean total recoverable oil and grease as measured by the procedure listed in 40 CFR Part 136.

(c) The term "commission scouring" shall mean the scouring of wool, 50 percent or more of which is owned by others, in mills that are 51 percent or more independent (i.e., only a minority ownership by company(ies) with greige or integrated operations); the mills must process 20 percent or more of their commissioned production through batch, noncontinuous processing operations.

§ 410.12 Effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT).

(a) Except as provided in 40 CFR 125.30–125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT):

Pollutant or pollutant property	BPT limitations	
	Maximum for any 1 day	Average of daily values for 30 consecutive days
	Kg/kkg (or pounds per 1,000 lb) of wool	
BOD5	10.6	5.3
COD	138.0	69.0
TSS	32.2	16.1
Oil and grease	7.2	3.6
Sulfide	0.20	0.10
Phenol	0.10	0.05
Total chromium	0.10	0.05
pH	(¹)	(¹)

¹Within the range 6.0 to 9.0 at all times.

(b) Additional allocations equal to the effluent limitations established in paragraph (a) of this section are allowed any existing point source subject to such effluent limitations that scours wool through "commission scouring" as defined in § 410.11.

§ 410.13 Effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT).

(a) Except as provided in 40 CFR 125.30–125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT):

Pollutant or pollutant property	BAT limitations	
	Maximum for any 1 day	Average of daily values for 30 consecutive days
	Kg/kkg (or pounds per 1,000 lb) of wool	
COD	138.0	69.0
Sulfide	0.20	0.10
Phenols	0.10	0.05
Total chromium	0.10	0.05

(b) Additional allocations equal to the effluent limitations established in paragraph (a) of this section are allowed any existing point source subject to such effluent limitations that scours wool through "commission scouring" as defined in § 410.11.

§ 410.14 Pretreatment standards for existing sources (PSES).

Any existing source subject to this subpart that introduces process wastewater pollutants into a publicly owned treatment works must comply with 40 CFR Part 403.

§ 410.15 New source performance standards (NSPS).

Any new source subject to this subpart must achieve the following new source performance standards (NSPS):

Pollutant or pollutant property	NSPS	
	Maximum for any 1 day	Average of daily values for 30 consecutive days
	Kg/kkg (or pounds per 1,000 lb) of wool	
BOD5	3.6	1.9
COD	52.4	33.7
TSS	30.3	13.5
Sulfide	0.20	0.10

Pollutant or pollutant property	NSPS	
	Maximum for any 1 day	Average of daily values for 30 consecutive days
	Kg/kkg (pounds per 1,000 lb) of product	
Phenols	0.10	0.05
Total chromium	0.10	0.05
pH	(1)	(1)

1 Within the range 6.0 to 9.0 at all times.

NOTE.—Additional allocations for "commission scouring" are not available to new sources.

§ 410.16 Pretreatment standards for new sources (PSNS).

Any new source subject to this subpart that introduces process wastewater pollutants into a publicly owned treatment works must comply with 40 CFR Part 403.

§ 410.17 Effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT). [Reserved]

Subpart B—Wool Finishing Subcategory

§ 410.20 Applicability; description of the wool finsihing subcategory.

The provisions of this subpart are applicable to process wastewater discharges resulting from the following types of textile mills: wool finishers, including carbonizing, fulling, dyeing, bleaching, rinsing, fireproofing, and other such similar processes.

§ 410.21 Specialized definitions.

In addition to the definitions set forth in 40 CFR Parts 401 and § 410.01 of this Part, the following definition applies to this subpart:

(a) The term "fiber" shall mean the dry wool and other fibers as received at the wool finsihing mill for processing into wool and blended products.

§ 410.22 Effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT).

(a) Except as provided in 40 CFR 125.30–125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT):

Pollutant or pollutant property	BPT limitations	
	Maximum for any 1 day	Average of daily values for 30 consecutive days
	Kg/kkg (or pound per 1,000 lb) of fiber	
BOD5	22.4	11.2
COD	163.0	81.5
TSS	35.2	17.6
Sulfide	0.28	0.14
Phenol	0.14	0.07
Total chromium	0.14	0.07
pH	(1)	(1)

1 Within the range 6.0 to 9.0 at all times.

(b) Additional allocations equal to the effluent limitations established in paragraph (a) of this section are allowed any existing point source subject to such effluent limitations that finishes wool or blended wool fabrics through "commission finishing" as defined in § 410.01.

§ 410.23 Effluent limitation representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT).

(a) Except as provided in 40 CFR 125.30–125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT):

Pollutant or pollutant property	BAT limitation	
	Maximum for any 1 day	Average of daily values for 30 consecutive days
	Kg/kkg (or pounds per 1,000 lb) of fiber	
COD	163.0	81.5
Sulfide	0.28	0.14
Phenols	0.14	0.07
Total Chromium	0.14	0.07

(b) Additional allocations equal to the effluent limitations established in paragraph (a) of this section are allowed any existing point source subject to such effluent limitations that finishes wool or blended wool fabrics through "commission finishing" as defined in § 410.01.

§ 410.24 Pretreatment standards for existing sources (PSES).

Any existing source subject to this subpart that introduces process wastewater pollutants into a publicly owned treatment works must comply with 40 CFR Part 403.

§ 410.25 New source performance standards (NSPS).

Any new source subject to this subpart must achieve the following new source performance standards (NSPS):

Pollutant or pollutant property	NSPS	
	Maximum for any 1 day	Average of daily values for 30 consecutive days
	Kg/kkg (pounds per 1,000 lb) of fiber	
BOD5	10.7	5.5
COD	113.8	73.3
TSS	32.3	14.4
Sulfide	0.28	0.14
Phenols	0.14	0.07
Total Chromium	0.14	0.07
pH	(1)	(1)

Note: Additional allocations for "commission finishers" are not available to new sources.

1 Within the range 6.0 to 9.0 at all times.

§ 410.26 Pretreatment standards for new sources (PSNS).

Any new source subject to this subpart that introduces process wastewater pollutants into a publicly owned treatment works must comply with 40 CFR Part 403.

§ 410.27 Effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT). [Reserved]

Subpart C—Low Water Use Processing Subcategory

§ 410.30 Applicability; description of the low water use processing subcategory.

The provisions of this subpart are applicable to process wastewater discharges resulting from the following types of textile mills: yarn manufacture, yarn texturizing, unfinished fabric manufacture, fabric coating, fabric laminating, tire cord and fabric dipping, and carpet tufting and carpet backing. Rubberized or rubber coated fabrics regulated by 40 CFR Part 428 are specifically excluded.

§ 410.31 Specialized definitions.

In addition to the definitions set forth in 40 CFR Part 401 and § 410.01 of this Part, the following definitions apply to this subpart:

(a) The term "general processing" shall mean the internal subdivision of the low water use processing subcategory for facilities described in § 410.30 that do not qualify under the water jet weaving subdivision.

(b) The term "water jet weaving" shall mean the internal subdivision of the low water use processing subcategory for facilities primarily engaged in manufacturing woven greige goods through the water jet weaving process.

§ 410.32 Effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT).

Except as provided in 40 CFR 125.30–125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BPT):

GENERAL PROCESSING

Pollutant or pollutant property	BPT limitations	
	Maximum for any 1 day	Average of daily values for 30 consecutive days
	Kg/kkg (pounds per 1,000 lb) of product	
BOD5	1.4	0.7
COD	2.8	1.4
TSS	1.4	0.7
ph	(1)	(1)

[1] Within the range 6.0 to 9.0 at all times.

WATER JET WEAVING

Pollutant or pollutant property	BPT limitations	
	Maximum for any 1 day	Average of daily values for 30 consecutive days
	Kg/kkg (pounds per 1,000 1lb) of product	
BOD5	8.9	4.6
COD	21.3	13.7
TSS	5.5	2.5
ph	(1)	(1)

[1] Within the range 6.0 to 9.0 at all times.

§ 410.33 Effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT).

Except as provided in 40 CFR 125.30–125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT):

GENERAL PROCESSING

Pollutant or pollutant property	BAT limitations	
	Maximum for any 1 day	Average of daily values for 30 consecutive days
	Kg/kkg (pounds per 1,000 lb) of product	
COD	2.8	1.4

WATER JET WEAVING

Pollutant or pollutant property	BAT limitations	
	Maximum for any 1 day	Average of daily values for 30 consecutive days
	Kg/kkg (pounds per 1,000 lb) of product	
COD	21.3	13.7

§ 410.34 Pretreatment standards for existing sources (PSES).

Any existing source subject to this subpart that introduces process wastewater pollutants into a publicly owned treatment works must comply with 40 CFR Part 403.

§ 410.35 New source performance standards (NSPS)

Any new source subject to this subpart must achieve the following new source performance standards (NSPS):

GENERAL PROCESSING

Pollutant or pollutant property	NSPS	
	Maximum for any 1 day	Average of daily values for 30 consecutive days
	Kg/kkg (pounds per 1,000 lb) of product	
BOD[5]	1.4	0.7
COD	2.8	1.4
TSS	1.4	0.7
pH	(1)	(1)

[1] Within the range 6.0 to 9.0 at all times.

WATER JET WEAVING

Pollutant or pollutant property	NSPS	
	Maximum for any 1 day	Average of daily values for 30 consecutive days
	Kg/kkg (pounds per 1,000 lb) of product	
BOD5	8.9	4.6
COD	21.3	13.7
TSS	5.5	2.5
pH	(1)	(1)

[1] Within the range 6.0 to 9.0 at all times.

§ 410.36 Pretreatment standards for new sources (PSNS).

Any new source subject to this subpart that introduces process wastewater pollutants into a publicly owned treatment works must comply with 40 CFR Part 403.

§ 410.37 Effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT). [Reserved]

Subpart D—Woven Fabric Finishing Subcategory

§ 410.40 Applicability; description of the woven fabric finishing subcategory.

The provisions of this subpart are applicable to process wastewater discharges resulting from the following types of textile mills: woven fabric finishers, which may include any or all of the following unit operations: desizing, bleaching, mercerizing, dyeing, printing, resin treatment, water proofing, flame proofing, soil repellency application and a special finish application.

§ 410.41 Specialized definitions.

In addition to the definitions set forth in 40 CFR Part 401 and § 410.01 of this Part the following definitions apply to this subpart:

(a) The term "simple manufacturing operation" shall mean all the following unit processes: desizing, fiber preparation and dyeing.

(b) The term "complex manufacturing operation" shall mean "simple" unit processes (desizing, fiber preparation and dyeing) plus any additional manufacturing operations such as printing, water proofing, or applying stain resistance or other functional fabric finishes.

(c) For NSPS (§ 410.45) the term "desizing facilities" shall mean those facilities that desize more than 50 percent of their total production. These facilities may also perform other processing such as fiber preparation, scouring, mercerizing, functional finishing, bleaching, dyeing and printing.

§ 410.42 Effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT).

(a) Except as provided in 40 CFR 125.30–125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT):

Pollutant or pollutant property	BPT limitations	
	Maximum for any 1 day	Average of daily values for 30 consecutive days
	Kg/kkg (or pounds per 1,000 lb) of product	
BOD5	6.6	3.3
COD	60.0	30.0
TSS	17.8	8.9
Sulfide	0.20	0.10
Phenol	0.10	0.05
Total Chromium	0.10	0.05
pH	[1]	[1]

1 Within the range 6.0 to 9.0 at all times.

(b) Except as provided in paragraph (e) of this section for commission finishing operations, the following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section and attributable to the finishing of woven fabrics through simple manufacturing operations employing a synthetic fiber or through complex manufacturing operations employing a natural fiber, which may be discharged by a point source subject to the provisions of this subpart, in addition to the discharge allowed by paragraph (a) of this section.

Pollutant or pollutant property	BPT limitations	
	Maximum for any 1 day	Average of daily values for 30 consecutive days
	Kg/kkg (or pounds per 1,000 lb) of product	
COD	20.0	10.0

(c) Except as provided in paragraph (e) of this section for commission finishing operations, the following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section and attributable to the finishing of woven fabrics through simple manufacturing operations employing a natural and synthetic fiber blend or through complex manufacturing operations employing a synthetic fiber, which may be discharged by a point source subject to the provisions of this subpart, in addition to the discharge allowed by paragraph (a) of this section.

Pollutant or pollutant property	BPT limitations	
	Maximum for any 1 day	Average of daily values for 30 consecutive days
	Kg/kkg (or pounds per 1,000 lb) of product	
COD	40.0	20.0

(d) Except as provided in paragraph (e) of this section for commission finishing operations, the following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section and attributable to the finishing of woven fabrics through complex manufacturing operations employing a natural and synthetic fiber blend, which may be discharged by a point source subject to the provisions of this subpart, in addition to the discharge allowed by paragraph (a) of this subpart.

Pollutant or pollutant property	BPT limitations	
	Maximum for any 1 day	Average of daily values for 30 consecutive days
	Kg/kkg (or pound per 1,000 lb) of product	
COD	60.0	30.0

(e) Additional allocations equal to the effluent limitations established in paragraph (a) of this section are allowed any existing point source subject to such effluent limitations that finishes woven fabrics through "commission finishing" as defined in § 410.01.

§ 410.43 Effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT).

(a) Except as provided in 40 CFR 125.30–125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT):

Pollutant or pollutant property	BAT limitations	
	Maximum for any 1 day	Average of daily values for 30 consecutive days
	Kg/kkg (or pound per 1,000 lb) of product	
COD	60.0	30.0
Sulfide	0.20	0.10
Phenols	0.10	0.05
Total Chromium	0.10	0.05

(b) Except as provided in paragraph (e) of this section for commission finishing operations, the following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section and attributable to the finishing of woven fabrics through simple manufacturing operations employing a synthetic fiber or through complex manufacturing operations employing a natural fiber, which may be discharged by a point source subject to the provisions of this subpart, in addition to the discharge allowed by paragraph (a) of this section.

Pollutant or pollutant property	BAT limitations	
	Maximum for any 1 day	Average of daily values for 30 consecutive days
	Kg/kkg (or pounds per 1,000 lb) of product	
COD	20.0	10.0

(c) Except as provided in paragraph (e) of this section for commission finishing operations, the following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section and attributable to the finishing of woven fabrics through simple manufacturing operations employing a natural and synthetic fiber blend or through complex manufacturing operations employing a synthetic fiber, which may be discharged by a point source subject to the provisions of this subpart, in addition to the discharge allowed by paragraph (a) of this section.

Pollutant or pollutant property	BAT limitations	
	Maximum for any 1 day	Average of daily values for 30 consecutive days
	Kg/kkg (or pounds per 1,000 lb) of product	
COD	40.0	20.0

(d) Except as provided in paragraph (e) of this section for commission finishing operations, the following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section and attributable to the finishing of woven fabrics through complex manufacturing operations employing a natural and synthetic fiber blend, which may be discharged by a point source subject to the provisions of this subpart, in addition to the discharge allowed by paragraph (a) of this subpart.

Pollutant or pollutant property	BAT limitations	
	Maximum for any 1 day	Average of daily values for 30 consecutive days
	Kg/kkg (or pounds per 1,000 lb) of product	
COD	60.0	30.0

(e) Additional allocations equal to the effluent limitations established in paragraph (a) of this section are allowed any existing point source subject to such effluent limitations that finishes woven fabrics through "commission finishing" as defined in § 410.01.

§ 410.44 Pretreatment standards for existing sources (PSES).

Any existing source subject to this subpart that introduces process wastewater pollutants into a publicly owned treatment works must comply with 40 CFR Part 403.

§ 410.45 New source performance standards (NSPS).

Any new source subject to this subpart must achieve the following new source performance standards (NSPS):

SIMPLE MANUFACTURING OPERATIONS

Pollutant or pollutant property	NSPS	
	Maximum for any 1 day	Average of daily values for 30 consecutive days
	Kg/kkg (or pounds per 1,000 lb) of product	
BOD5	3.3	1.7
COD	41.7	26.9
TSS	8.8	3.9
Sulfide	0.20	0.10
Phenols	0.10	0.05
Total Chromium	0.10	0.05
pH[1]	(1)	(1)

[1]Within the range 6.0 to 9.0 at all times.

NOTE.—Additional allocations for "commission finishers" are not available to new sources.

COMPLEX MANUFACTURING OPERATIONS

Pollutant or pollutant property	NSPS	
	Maximum for any 1 day	Average of daily values for 30 consecutive days
	Kg/kkg (or pounds per 1,000 lb) of product	
BOD5	3.7	1.9
COD	68.7	44.2
TSS	14.4	6.4
Sulfide	0.20	0.10
Phenols	0.10	0.05
Total Chromium	0.10	0.05
pH[1]	(1)	(1)

[1]Within the range 6.0 to 9.0 at all times.

NOTE.—Additional allocations for "commission finishers" are not available to new sources.

DESIZING

Pollutant or pollutant property	NSPS	
	Maximum for any 1 day	Average of daily values for 30 consecutive days
	Kg/kkg (or pounds per 1,000 lb) of product	
BOD5	5.5	2.8
COD	59.5	38.3
TSS	15.6	6.9
Sulfide	0.20	0.10
Phenols	0.10	0.05
Total Chromium	0.10	0.05
pH	(1)	(1)

[1]Within the range 6.0 to 9.0 at all times.

NOTE.—Additional allocations for "commission finishers" are not available to new sources.

§ 410.46 Pretreatment standards for new sources (PSNS).

Any new source subject to this subpart that introduces process wastewater pollutants into a publicly owned treatment works must comply with 40 CFR Part 403.

§ 410.47 Effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT). [Reserved]

Subpart E—Knit Fabric Finishing Subcategory

§ 410.50 Applicability; description of the knit fabric finishing subcategory.

The provisions of this subpart are applicable to process wastewater discharges resulting from the following types of textile mills: knit fabric finishers, which may include any or all of the following unit operations: bleaching, mercerizing, dyeing, printing, resin treatment, water proofing, flame proofing, soil repellency application and a special finish application.

§ 410.51 Specialized definitions.

In addition to the definitions set forth in 40 CFR Part 401 and § 410.01 of this Part, the following definitions apply to this subpart:

(a) The term "simple manufacturing operation" shall mean all the following unit processes: desizing, fiber preparation and dyeing.

(b) The term "complex manufacturing operation" shall mean "simple" unit processes (desizing, fiber preparation and dyeing) plus any additional manufacturing operations such as printing, water proofing, or applying stain resistance or other functional fabric finishes.

(c) For NSPS (Section 410.55) the term "hosiery products" shall mean the internal subdivision of the knit fabric finishing subcategory for facilities that are engaged primarily in dyeing or finishing hosiery of any type.

§ 410.52 Effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT).

(a) Except as provided in 40 CFR 125.30–125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT):

Pollutant or pollutant property	BPT limitations	
	Maximum for any 1 day	Average of daily values for 30 consecutive days
	Kg/kkg (or pounds per 1,000 lb) of product	
BOD5	5.0	2.5
COD	60.0	30.0
TSS	21.8	10.9
Sulfide	0.20	0.10
Phenols	0.10	0.05
Total chromium	0.10	0.05
pH	(1)	(1)

[1]Within the range 6.0 to 9.0 at all times.

(b) Except as provided in paragraph (d) of this section for commission finishing operations, the following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section and attributable to the finishing of knit fabrics through simple manufacturing operations employing a natural and synthetic fiber or through complex manufacturing operations employing a synthetic fiber, which may be discharged by a point source subject to the provisions of this subpart, in addition to the discharge allowed by paragraph (a) of this section.

Pollutant or pollutant property	BPT limitations	
	Maximum for any 1 day	Average of daily values for 30 consecutive days
	Kg/kkg (or pounds per 1,000 lb) of product	
COD	20.0	10.0

(c) Except as provided in paragraph (d) of this section for commission finishing operations, the following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section and attributable to the finishing of knit fabrics through complex manufacturing operations employing a natural and synthetic fiber blend, which may be discharged by a point source subject to the provisions of this subpart, in addition to the discharge allowed by paragraph (a) of this section.

Pollutant or pollutant property	BPT limitations	
	Maximum for any 1 day	Average of daily values for 30 consecutive days
	Kg/kkg (or pounds per 1,000 lb) of product	
COD	40.0	20.0

(d) Additional allocations equal to the effluent limitations established in paragraph (a) of this section are allowed any existing point source subject to such effluent limitations that finishes knit fabrics through "commission finishing" as defined in § 410.01.

§ 410.53 Effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT).

(a) Except as provided in 40 CFR 125.30–125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT):

Pollutant or pollutant property	BAT limitations	
	Maximum for any 1 day	Average of daily values for 30 consecutive days
	Kg/kkg (or pounds per 1,000 lb) of product	
COD	60.0	30.0
Sulfide	0.20	0.10
Phenols	0.10	0.05
Total Chromium	0.10	0.05

(b) Except as provided in paragraph (d) of this section for commission finishing operations, the following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section and attributable to the finishing of knit fabrics through simple manufacturing operations employing a natural and synthetic fiber or through complex manufacturing operations employing a synthetic fiber, which may be discharged by a point source subject to the provisions of this subpart, in addition to the discharge allowed by paragraph (a) of this section.

Pollutant or pollutant property	BAT limitations	
	Maximum for any 1 day	Average of daily values for 30 consecutive days
	Kg/kkg (or pounds per 1,000 lb) of product	
COD	20.0	10.0

(c) Except as provided in paragraph (d) of this section for commission finishing operations, the following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section and attributable to the finishing of knit fabrics through complex manufacturing operations employing a natural and synthetic fiber blend, which may be discharged by a point source subject to the provisions of this subpart, in addition to the discharge allowed by paragraph (a) of this section.

Pollutant or pollutant property	BAT limitations	
	Maximum for any 1 day	Average of daily values for 30 consecutive days
	Kg/kkg (or pounds per 1,000 lb) of product	
COD	40.0	20.0

(d) Additional allocations equal to the effluent limitations established in paragraph (a) of this section are allowed any existing point source subject to such effluent limitations that finishes knit fabrics through "commission finishing" as defined in § 410.01.

§ 410.54 Pretreatment standards for existing sources (PSES).

Any existing source subject to this subpart that introduces process wastewater pollutants into a publicly owned treatment works must comply with 40 CFR Part 403.

§ 410.55 New source performance standards (NSPS).

Any new source subject to this subpart must achieve the following new source performance standards (NSPS):

SIMPLE MANUFACTURING OPERATIONS

Pollutant or pollutant property	NSPS	
	Maximum for any 1 day	Average of daily values for 30 consecutive days
	Kg/kkg (or pounds per 1,000 lb) of product	
BOD5	3.6	1.9
COD	48.1	31.0
TSS	13.2	5.9
Sulfide	0.20	0.10
Phenols	0.10	0.05
Total chromium	0.10	0.05
pH	(1)	(1)

1 Within the range 6.0 to 9.0 at all times.

NOTE.—Additional allocations for "commission finishers" are not available to new sources.

COMPLEX MANUFACTURING OPERATIONS

Pollutant or pollutant property	NSPS	
	Maximum for any 1 day	Average of daily values for 30 consecutive days
	Kg/kkg (or pounds per 1,000 lb) of product	
BOD5	4.8	2.5
COD	51.0	32.9
TSS	12.2	5.4
Sulfide	0.20	0.10
Phenols	0.10	0.05
Total Chromium	0.10	0.05
pH	(1–)	(1–)

1 Within the range 6.0 to 9.0 at all times.

NOTE.—Additional allocations for "commission finishers" are not available to new sources.

HOSIERY PRODUCTS

Pollutant or pollutant property	NSPS	
	Maximum for any 1 day	Average of daily values for 30 consecutive days
	Kg/kkg (or pounds per 1,000 lb) of product	
BOD5	2.3	1.2
COD	30.7	19.8
TSS	8.4	3.7
Sulfide	0.20	0.10
Phenols	0.10	0.05
Total Chromium	0.10	0.05
pH	(1–)	(1–)

1 Within the range 6.0 to 9.0 at all times.

NOTE.—Additional allocations for "commission finishers" are not available to new sources.

§ 410.56 Pretreatment standards for new sources (PSNS).

Any new source subject to this subpart that introduces process wastewater pollutants into a publicly owned treatment works must comply with 40 CFR Part 403.

§ 410.57 Effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT). [Reserved]

Subpart F—Carpet Finishing Subcategory

§ 410.60 Applicability; description of the carpet finishing subcategory.

The provisions of this subpart are applicable to process wastewater discharges resulting from the following types of textile mills: carpet mills, which may include any or all of the following unit operations: Bleaching, scouring, carbonizing, fulling, dyeing, printing, resin treatment, waterproofing, flameproofing, soil repellency, looping, and backing with foamed and unfoamed latex and jute. Carpet backing without other carpet manufacturing operations is included in Subpart C.

§ 410.61 Specialized definitions.

In addition to the definitions set forth in 40 CFR Part 401 and § 410.01 of this Part, the following definitions apply to this subpart:

(a) The term "product" shall mean the final carpet produced or processed including the primary backing but excluding the secondary backing.

(b) The term "simple manufacturing operation" shall mean the following unit processes: fiber preparation and dyeing with or without carpet backing.

(c) The term "complex manufacturing operation" shall mean "simple" unit processes (fiber preparation, dyeing and carpet backing) plus any additional manufacturing operations such as printing or dyeing and printing.

§ 410.62 Effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT).

(a) Except as provided in 40 CFR 125.30–125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT):

Pollutant or pollutant property	BPT limitations: Maximum for any 1 day	BPT limitations: Average of daily values for 30 consecutive days
	Kg/kkg (or pounds per 1,000 lb) of product	
BOD5	7.8	3.9
COD	70.2	35.1
TSS	11.0	5.5
Sulfide	0.08	0.04
Phenol	0.04	0.02
Total Chromium	0.04	0.02
pH	(1)	(1)

[1] Within the range 6.0 to 9.0 at all times.

(b) The following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section and attributable to the manufacture of carpets through complex manufacturing operations, which may be discharged by a point source subject to the provisions of this subpart, in addition to the discharge allowed by paragraph (a) of this section.

Pollutant or pollutant property	BPT limitations: Maximum for any 1 day	BPT limitations: Average of daily values for 30 consecutive days
	Kg/kkg (or pounds per 1,000 lb) of product	
COD	20.0	10.0

§ 410.63 Effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT).

(a) Except as provided in 40 CFR 125.30–125.32, any existing point source subject to this subpart must achieve the following efflluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT):

Pollutant or pollutant property	BAT limitations: Maximum for any 1 day	BAT limitations: Average of daily values for 30 consecutive days
	Kg/kkg (or pounds per 1,000 lb) of product	
COD	70.2	35.1
Sulfide	0.08	0.04
Phenols	0.04	0.02
Total chromium	0.04	0.02

(b) The following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section and attributable to the manufacture of carpets through complex manufacturing operations, which may be discharged by a point source subject to the provisions of this subpart, in addition to the discharge allowed by paragraph (a) of this section.

Pollutant or pollutant property	BAT limitations: Maximum for any 1 day	BAT limitations: Average of daily values for 30 consecutive days
	Kg/kkg (or pounds per 1,000 lb) of product	
COD	20.0	10.0

§ 410.64 Pretreatment standards for existing sources (PSES).

Any existing source subject to this subpart that introduces process wastewater pollutants into a publicly owned treatment works must comply with 40 CFR Part 403.

§ 410.65 New source performance standards (NSPS).

Any new source subject to this subject must achieve the following new source performance standards (NSPS):

Pollutant or pollutant property	NSPS limitations: Maximum for any 1 day	NSPS limitations: Average of daily values for 30 consecutive days
	kg/kkg (or pounds per 1,000 lb) of product	
BOD5	4.6	2.4
COD	26.6	17.1
TSS	8.6	3.8
Sulfide	0.08	0.04
Phenols	0.04	0.02
Total chromium	0.04	0.02
pH	(1)	(1)

[1] Within the range 6.0 to 9.0 at all times.

NOTE.—Additional allocations for "commission finishers" are not available to new sources.

§ 410.66 Pretreatment standards for new sources (PSNS).

Any new source subject to this subpart that introduces process wastewater pollutants into a publicly owned treatment works must comply with 40 CFR Part 403.

§ 410.67 Effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT). [Reserved]

Subpart G—Stock and Yarn Finishing Subcategory

§ 410.70 Applicability; description of the stock and yarn finishing subcategory.

The provisions of this subpart are applicable to process wastewater discharges resulting from the following types of textile mills: stock or yarn dyeing or finishing, which may include any or all of the following unit operations and processes: cleaning, scouring, bleaching, mercerizing, dyeing and special finishing.

§ 410.71 Specialized definitions. [Reserved]

§ 410.72 Effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT).

(a) Except as provided in 40 CFR 125.30–125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT):

Pollutant or pollutant property	BPT limitations	
	Maximum for any 1 day	Average of daily values for 30 consecutive days
	Kg/kkg (or pounds per 1,000 lb) of product	
BOD5	6.8	3.4
COD	84.6	42.3
TSS	17.4	8.7
Sulfide	0.24	0.12
Phenol	0.12	0.06
Total chromium	0.12	0.06
pH	(1)	(1)

[1] Within the range 6.0 to 9.0 at all times.

§ 410.73 Effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT).

Except as provided in 40 CFR 125.30–125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT):

Pollutant or pollutant property	BAT limitations	
	Maximum for any 1 day	Average of daily values for 30 consecutive days
	Kg/kkg (or pounds per 1,000 lb) of product	
COD	84.6	42.3
Sulfide	0.24	0.12
Phenols	0.12	0.06
Total chromium	0.12	0.06

§ 410.74 Pretreatment standards for existing sources (PSES).

Any existing source subject to this subpart that introduces process wastewater pollutants into a publicly owned treatment works must comply with 40 CFR Part 403.

§ 410.75 New source performance standards (NSPS).

Any new source subject to this subpart must achieve the following new source performance standards (NSPS):

Pollutant or pollutant property	NSPS	
	Maximum for any 1 day	Average of daily values for 30 consecutive days
	Kg/kkg (or pounds per 1,000 lb) of product	
BOD5	3.6	1.9
COD	33.9	21.9
TSS	9.8	4.4
Sulfide	0.24	0.12
Phenols	0.12	0.06
Total chromium	0.12	0.06
pH	(1)	(1)

[1] Within the range 6.0 to 9.0 at all times.

NOTE.—Additional allocations for "commission finishers" are not available to new sources.

§ 410.76 Pretreatment standards for new sources (PSNS).

Any new source subject to this subpart that introduces process wastewater pollutants into a publicly owned treatment works must comply with 40 CFR Part 403.

§ 410.77 Effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT). [Reserved]

Subpart H—Nonwoven Manufacturing Subcategory

§ 410.80 Applicability; description of the nonwoven manufacturing subcategory.

The provisions of this subpart are applicable to process wastewater discharges resulting from facilities that primarily manufacture nonwoven textile products of wool, cotton, or synthetics, singly or as blends, by mechanical, thermal, and/or adhesive bonding procedures. Nonwoven products produced by fulling and felting processes are covered in Subpart I—Felted Fabric Processing.

§ 410.81 Specialized definitions. [Reserved]

§ 410.82 Effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT).

Except as provided in 40 CFR 125.30–125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT):

Pollutant or pollutant property	BPT limitations	
	Maximum for any 1 day	Average of daily values for 30 consecutive days
	Kg/kkg (or pounds per 1,000 lb) of product	
BOD5	4.4	2.2
COD	40.0	20.0
TSS	6.2	3.1
Sulfide	0.046	0.023
Phenol	0.023	0.011
Total chromium	0.023	0.011
pH	(1)	(1)

[1] Within the range 6.0 to 9.0 at all times.

§ 410.83 Effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT).

Except as provided in 40 CFR 125.30–125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT):

Pollutant or pollutant property	BAT limitations	
	Maximum for any 1 day	Average of daily values for 30 consecutive days
	Kg/kkg (or pounds per 1,000 lb) of product	
COD	40.0	20.0
Sulfide	0.046	0.023
Phenols	0.023	0.011
Total chromium	0.023	0.011

§ 410.84 Pretreatment standards for existing sources (PSES).

Any existing source subject to this subpart that introduces process wastewater pollutants into a publicly owned treatment works must comply with 40 CFR Part 403.

§ 410.85 New source performance standards (NSPS).

Any new source subject to this subpart must achieve the following new source performance standards (NSPS):

Pollutant or pollutant property	NSPS	
	Maximum for any 1 day	Average of daily values for 30 consecutive days
	Kg/kkg (or pounds per 1,000 lb) of product	
BOD_5	2.6	1.4
COD	15.2	9.8
TSS	4.9	2.2
Sulfide	0.046	0.023
Phenols	0.023	0.011
Total Chromium	0.023	0.011
pH	(1)	(1)

[1] Within the range 6.0 to 9.0 at all times.

NOTE.—Additional allocations for "commission finishers" are not available to new sources.

§ 410.86 Pretreatment standards for new sources (PSNS).

Any new source subject to this subpart that introduces process wastewater pollutants into a publicly owned treatment works must comply with 40 CFR Part 403.

§ 410.87 Effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT). [Reserved]

Subpart I—Felted Fabric Processing Subcategory

§ 410.90 Applicability; description of the felted fabric processing subcategory.

The provisions of this subpart are applicable to process wastewater discharges resulting from facilities that primarily manufacture nonwoven products by employing fulling and felting operations as a means of achieving fiber bonding.

§ 410.91 Specialized definitions. [Reserved]

§ 410.92 Effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT).

Except as provided in 40 CFR 125.30–125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT):

Pollutant or pollutant property	BPT limitations	
	Maximum for any 1 day	Average of daily values for 30 consecutive days
	Kg/kkg (or pounds per 1,000 lb) of product	
BOD_5	35.2	17.6
COD	256.8	128.4
TSS	55.4	27.7
Sulfide	0.44	0.22
Phenol	0.22	0.11
Total chromium	0.22	0.11
pH	(1)	(1)

[1] Within the range 6.0 to 9.0.

§ 410.93 Effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT).

Except as provided in 40 CFR 125.30–125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT):

Pollutant or pollutant property	BAT limitations	
	Maximum for any 1 day	Average of daily values for 30 consecutive days
	Kg/kkg (or pounds per 1,000 lb) of product	
COD	256.8	128.4
Sulfide	0.44	0.22
Phenols	0.22	0.11
Total Chromium	0.22	0.11

§ 410.94 Pretreatment standards for existing sources (PSES).

Any existing source subject to this subpart that introduces process wastewater pollutants into a publicly owned treatment works must comply with 40 CFR Part 403.

§ 410.95 New Source performance standards (NSPS).

Any new source subject to this subpart must achieve the following new source performance standards (NSPS):

Pollutant or pollutant property	NSPS	
	Maximum for any 1 day	Average of daily values for 30 consecutive days
	Kg/kkg (or pounds per 1,000 lb) of product	
BOD_5	16.9	8.7
COD	179.3	115.5
TSS	50.9	22.7
Sulfide	0.44	0.22
Phenols	0.22	0.11
Total Chromium	0.22	0.11
pH	(1)	(1)

[1] Within the range of 6.0 to 9.0 at all times.

NOTE.—Additional allocations for "commission finishers" are not available to new sources.

§ 410.96 Pretreatment standards for new sources (PSNS).

Any new source subject to this subpart that introduces process wastewater pollutants into a publicly owned treatment works must comply with 40 CFR Part 403.

§ 410.97 Effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT). [Reserved]

[FR Doc. 82-24133 Filed 9-1-82; 8:45 am]

BILLING CODE 6560-50-M

federal register

Thursday
September 2, 1982

Part VI

Environmental Protection Agency

Standards of Performance for New Stationary Sources; Lime Manufacturing Plants; Proposed Response To Court Remand and Proposed Rule Change

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 60

[A-FRL-2058-4]

Standards of Performance for New Stationary Sources; Lime Manufacturing Plants

AGENCY: Environmental Protection Agency (EPA).

ACTION: Proposed response to court remand and proposed rule change.

SUMMARY: This is a proposed response to the remand of new source performance standards for lime manufacturing plants by the United States Court of Appeals for the District of Columbia Circuit. This response addresses the questions raised by the Court in *National Lime Association v. EPA*, 627 F.2d 416 (1980) and proposed amendments to the standards. The standards as amended will apply to all affected facilities constructed, reconstructed, or modified after May 3, 1977.

A public hearing will be held, if requested, to provide interested persons an opportunity for oral presentations of data, views, or arguments concerning the proposed standards.

DATES: *Comments.* Comments must be received by November 1, 1982

ADDRESSES:

Comments. Comments should be submitted (in duplicate if possible) to: Central Docket Section (A-130), Attention: Docket Number A-80-53, U.S. Environmental Protection Agency, 401 M Street, S.W., Washington, D.C. 20460.

Public Hearing. Persons wishing to request a hearing should notify Mrs. Naomi Durkee, Standards Development Branch, Emission Standards and Engineering Division (MD-13), U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711, telephone number (919) 541-5578. If requested, the public hearing will be announced in the **Federal Register.**

Docket. Docket No. A-80-53, containing supporting information used in developing the proposed remand response and amendments, is available for public inspection and copying between 8:00 a.m. and 4:00 p.m., Monday through Friday, at the EPA's Central Docket Section, West Tower Lobby, Gallery 1, Waterside Mall, 401 M Street, S.W., Washington, D.C. 20460. Throughout this notice, numbers which appear in parentheses are citations to the docket. Material cited in this way may be obtained from the Central Docket Section if both the docket and citation numbers are provided. A reasonable fee may be charged for copying.

FOR FURTHER INFORMATION CONTACT: Mr. John Crenshaw, 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:

Background

New source performance standards (NSPS) for lime manufacturing plants were proposed on May 3, 1977 (Docket No. A-80-53/74-5-I-G-2; hereinafter "Docket No. A-80-53/74-5" will be omitted from the docket references in this document). Final rules were promulgated on March 7, 1978 (I-K-3). As promulgated, standards of performance for lime manufacturing plants limited particulate emissions from rotary lime kilns to no greater than 0.15 kilogram per megagram (kg/Mg) (0.30 pound per ton (lb/ton)) of limestone feed. Opacity from rotary lime kilns was limited to less than 10 percent. The particulate emission limit for any lime hydrator was 0.075 kg/Mg (0.15 lb/ton) of lime feed.

The National Lime Association (NLA) filed a petition for review of the lime manufacturing NSPS with the United States Court of Appeals for the District of Columbia Circuit. On May 19, 1980, the Court of Appeals remanded the standard to the EPA Administrator. This notice contains the EPA's proposed response to the remand and proposed amendments to the NSPS.

Summary of Court's Decision

In *National Lime Association v. EPA*, 627 F.2d 416 (1980), the Court held that there was inadequate support in the administrative record for the standards promulgated and, therefore, remanded the case to the Agency for additional explanation or analysis. The Court felt that there were a number of process variables that could affect the generation and controllability of particulate emissions from lime plants and that the Agency had not adequately evaluated these variables with respect to the achievability of the standards. In characterizing the performance of emission control systems, the Agency had relied on emission tests from several lime manufacturing plants. The Court found that, by failing to establish the representativeness of the tested plants with respect to process operating variables, the Agency had not demonstrated that the standard was achievable under the most adverse conditions which reasonably could be expected to recur. While the remand focused chiefly on the mass emission standard for lime kilns, the Court concluded that the hydrator and opacity standards were subject to some of the same problems, and they were remanded as well.

In discussing the representativeness of data relied upon for the kiln mass emission standard, the Court identified three main issues. First variations in the quantity of dust generated in a kiln may affect the achievability of the standard. The Court specified factors that may contribute to the quantity of dust generated: Feedstock variation (size and chemical composition), gas velocity, plant operating level, and rate of kiln rotation. Second, the Court was concerned with variations in the controllability of particulate matter generated in the kiln. Given the emphasis in the 1977 Clean Air Act amendments on coal usage, the Court thought the effect of coal usage on emissions should be specifically examined and a rationale offered to demonstrate the standard's achievability for the full range of coal types in supply. The Court also thought that particle size was an important factor in controllability. Third, the Court was dissatisfied with the EPA's explanation of test data which were discarded from the Agency's data base. The Court found that there was inadequate support for the EPA's conclusions that emission controls at two tested plants (identified as Plants A and F) were not representative of well-designed or well-operated systems.

The Court concluded that inadequate account was taken of significant variables relevant to the achievability of the hydrator standard. The Court felt that the hydrator standard should be examined with respect to many of the same variables examined in the lime kiln standard, especially particle size and surface area. The impact on emisssions from the use of dolomitic limestone feedstock was also felt to deserve further consideration. In addition, the Agency had previously agreed to review the standard as it applies to pressure hydrators. In its brief to the Court, the Agency conceded that additional study of emissions from pressure hydrators was needed to determine what standards of performance, if any, should be established for pressure hydrators.

The opacity standard for lime kilns was remanded for two purposes. First, the EPA was directed to give careful consideration to variables that may affect opacity, especially stack diameter, particle size and shape, and stack gas exit velocity. Second, the Court felt the Agency should examine the representativeness of the lime kiln opacity standard with respect to the variables investigated in the kiln mass emission standard.

EPA Response to the Remand

After a comprehensive study of the issues of this case, the Administrator decided that some changes to the manufacturing NSPS are appropriate. The changes are to revise the rotary lime kiln emission to 0.30 kg/mg (0.60 lb/ton) of limestone feed and to delete the standard for hydrators. The changes are based on reanalysis of the data base and on inclusion of some previously discarded emission test data. With the inclusion of these data, the Administrator has concluded that the emission tests which comprise the data base are representative of the full range of emission control conditions which are likely to recur in future lime plants and that these emission data demonstrate the achievability of the proposed amended standards throughout the industry.

In addition to examining the emission test data, the Agency also conducted an extensive examination of the impact of process variables on the performance of particulate control devices. The Agency has investigated the effects on emissions of variations in raw materials, fuels, and plant operating parameters. All of these factors affect to some degree the amount of particulate matter generated in lime kilns. The Administrator has determined, however, that the range of emissions caused by process variables can be controlled at reasonable cost through proper design and operation of emission control systems. The record shows that the capability of the designated particulate control systems to meet the proposed standards is not limited by process variations that are expected to occur in the lime manufacturing industry.

The proposed revision to the particulate standard for rotary lime kilns is based on the use of either a fabric filter (baghouse) or an electrostatic precipitator (ESP) control device. The proposed revision would limit particulate emissions from new, modified, and reconstructed rotary lime kilns to 0.30 kg/Mg (0.60 lb/ton) of limestone feed. The original standard limited emissions to 0.15 kg/Mg (0.30 lb/ton) of limestone feed.

With respect to kilns, the proposed revision to the standard is based on the inclusion in the data base of emission test data from Plant A, which were excluded from consideration in promulgating the standard. After reevaluation, the EPA has concluded that the design of the fabric filter unit at Plant A is representative of other well-designed baghouses in the lime manufacturing industry. Although the Agency was unable to determine how well the Plant A baghouse had been operated and maintained at the time of the EPA emission testing, in the absence of contrary information, the EPA has determined that emission data from Plant A should be included in the data base. The Agency has also concluded that wet scrubbers are not the best demonstrated technology for control of particulate emissions from lime kilns. Therefore, emission data from Plant F (scrubber equipped) were not considered in establishing the proposed emission limit.

The standard for lime hydrators is being deleted. While available test data for wet fan scrubbers controlling emissions from lime hydrators support the promulgated emission limit (0.15 lb/ton), data to document the effect of particle size distribution on scrubber performance are limited. At this time, the Agency is not able to demonstrate that the standard for lime hydrators is achievable under the most adverse conditions which reasonably could be expected to recur.

The EPA reevaluated the achievability of the lime kiln opacity standard with regard to variations in stack diameter, particle size and shape, and stack gas exit velocity and concluded that the original lime kiln opacity standard was reasonable. In reaching this conclusion, the Administrator found that the data base was established under conditions that are representative for the entire lime manufacturing industry. The highest raw opacity 6-minute average reading observed among the 1,247 6-minute average readings taken at tested plants during normal operating was 6.7 percent. When the opacity averages were normalized to a 3.0-meter stack diameter, more than 99 percent of the normalized opacity averages did not exceed 10 percent. The Agency has concluded that the lime kiln opacity standard is achievable for stack diameters less than or equal to 3.0 meters. Therefore, the opacity standard should not be changed.

The Agency recognizes that a question exists whether this standard should apply to all sources that commenced construction after the date of the original proposal of the standard in 1977, or whether it should apply only to sources that commence construction after today's date. The Agency invites comment on this issue.

Discussion of Technical Issues Raised by the Court

The Agency has investigated and analyzed the issues raised by the Court of Appeals. For the purposes of analysis, these issues were divided into five major areas: (1) The controllability of particulate matter generated in a lime kiln; (2) the representatives of the data base with respect to factors that may contribute to variations in dust generation and the impact of those factors on the achievability of the kiln standard; (3) the data from Plants A and F that were originally discarded; (4) the representatives of the data base and achievability of the hydrator standard; and (5) the effect of stack diameter, particle size and shape, and gas velocity on the opacity standard. These areas are discussed in detail below.

Issue: Controllability of Dust Generated in Rotary Lime Kilns

A major question raised by the Court was how variations in uncontrolled inlet dust concentration and particle size distribution to a control device affect the achievability of the standard. The operating variables noted by the Court (feedstock characteristics, plant operating level, gas velocity through the kiln, kiln rotation rate, and fuel type) may affect the amount and the particle size of dust generated in a kiln. However, as discussed below, because of the performance characteristics of fiber filter and ESP control devices that are properly designed for a given application, these variables do not affect the controllability of the dust generated. These control device performance characteristics are well documented in the technical literature, through empirical data, and by the experience of control device vendors. As described in a later section ("Basis for Proposed Amendment"), wet scrubbers are not a basis for the lime kiln standard and, therefore, are not addressed in the following discussion.

a. *Fabric Filters.* Filtration theory is based on the interaction of a single particle with a filter medium. According to theory, particles are collected in fabric filtration by one or more of the following mechanisms (II–I–8):

(1) Impaction of a particle on the filter fibers or on previously retained particles due to the inertia of the particle;

(2) Diffusion of a particle to a filter fiber or other particle on the filter as a result of random molecular (Brownian) motion;

(3) Interception of a particle as a result of the particle diameter relative to the pore diameter of the filter medium;

(4) Gravitational settling due to the mass of the particle; and

(5) Electrostatic attraction between a particle and the filter medium.

Impaction, diffusion, and interception are the most important mechanisms for particle removal and are influenced by fabric face (filtration) velocity, particle mass, and particle diameter. Impaction efficiency increases with increasing filtering velocity and increasing particle size, whereas diffusional efficiency improves with reduced filtration velocity and decreasing particle size (II–I–8). An increase in the concentration of particles in the inlet gas stream increases the efficiency of particle removal by the above filtration mechanisms (II–D–33).

Particle-laden gas passing through the porous fabric causes dust particles to be deposited on individual fiber surfaces and within the interstices of the fiber matrix. Continued particle deposition on the fabric creates a uniform dust cake that functions as a porous filter medium. Because the pores of the fabric matrix are large relative to the diameter of the incoming particles, some particles at the dust cake/fabric interface will migrate through the fabric and escape into the effluent gas stream. Outlet dust concentration is relatively constant over time (except for short-term variations following cleaning of a compartment) and substantially independent of the dust concentration entering the fabric filter (II–A–31, II–D–33).

There are many examples that support this theory. Empirical data from a reverse-air baghouse on a pulp mill lime recovery kiln show that inlet particulate concentrations of 2.17 and 10.9 grains per dry standard cubic foot (gr/dscf) were both reduced by fabric filtration to an outlet concentration of 0.0005 gr/dscf (II–A–32). The lowest outlet concentration (0.0002 dr/dscf) was associated with an inlet concentration of 2.97 gr/dscf while the highest outlet concentration (0.0012 gr/dscf) was associated with an inlet concentration of 3.75 gr/dscf. Fly ash emissions from a reverse-air baghouse at the Sunbury Station power plant were 0.002 and 0.001 gr/dscf when inlet concentrations were 1.348 and 4.123 gr/dscf, respectively (II–A–20). In this case, the lowest outlet concentration was associated with the highest inlet concentration. By comparison, the outlet dust concentrations from EPA-tested baghouses in the lime industry were 0.0148, 0.029, 0.022, and 0.0059 gr/dscf for calculated inlet concentrations of 4.4, 10.0, 13.6, and 10.6 gr/dscf, respectively (I–K–1, I–I–20, II–B–20). It is clear that there is no correlation between high inlet dust concentration and high inlet concentration for properly designed and operated fabric filters.

The experience of fabric filter manufacturers confirms that outlet dust concentration is essentially independent of inlet dust concentration. Vendors routinely guarantee outlet concentrations between 0.01 and 0.015 grains per actual cubic foot (gr/acf) from baghouses on rotary lime kilns (II–D–33). At two recently constructed plants, baghouse vendors have guaranteed outlet concentrations of 0.01 gr/acf for inlet concentrations as high as 14 gr/acf (I–K–1; II–D–27, 32.)

Filtration theory predicts that particle size will have a limited effect on the efficiency of particle capture by the mechanisms previously described. For particles less than approximately 1 micrometer (μm) in diameter, diffusion is the primary capture mechanism; for particles greater than approximately 2 μm, impaction is the primary capture mechanism (II–E–8, II–I–8). Many fractional penetration curves show a dip in the fabric filter collection efficiency curve for particles between approximately 0.5 and 2 μm caused by the crossover of the primary collection mechanism from diffusion to impaction (II–E–8). Vendor experience with baghouse applications in the lime industry reveals no variations in the particle size distribution from rotary lime kilns that are great enough to affect the performance of a baghouse on a rotary lime kiln (II–D–33).

The design of a baghouse requires that certain information be known about the exhaust stream to be cleaned. If baghouses have not previously been used for a particular source category, the information that is needed includes expected mass emission rate, volumetric flow rate, and particle characteristics. This information is then compared with similar information and experience from other applications to establish the air-to-cloth (A/C) ratio, pressure drop, cleaning mechanism and frequency, and bag construction (e.g., material, weave). Once initial experience has been gained with the performance of baghouses in a particular industry (as it has in the lime manufacturing industry), control device vendors can predict the range within which the key design parameters must be maintained to achieve desired outlet emission concentrations. Accordingly, baghouse design in an industry such as lime manufacturing no longer requires specification of site-specific gas characteristics except the gas volume to be cleaned. After installation of the unit, the cleaning cycle is adjusted to optimize baghouse operation.

The general approach that is used to establish baghouse design parameters and to determine how they interrelate is described in the following paragraphs. The range of values for design parameters that have been employed in the lime industry and that would be expected at plants designed to meet the proposed lime kiln standard are discussed under "Discarded Emission Data From Plants A and F."

For a given baghouse, pressure drop is controlled largely by the cleaning cycle of the baghouse—pressure drop decreases as the frequency and/or intensity of cleaning increases. Overcleaning can cause a decrease in overall baghouse collection efficiency and can damage the bag fabric. Therefore, optimum pressure drop is determined by the dual consideration of collection efficiency and bag maintenance costs (II–I–8).

The A/C ratio is defined as the total volumetric air flow filtered divided by the total cloth filter area. The A/C ratio for a baghouse unit is selected on the basis of dust characteristics (e.g., particle shape, density, electrical charge, adsorptive properties), fabric type, and cleaning method. This parameter is affected by the tradeoff between initial baghouse capital cost and recurring energy costs (II–I–8). Typically, woven fabric bags and reverse-air or shake cleaning mechanisms are associated with A/C ratios ranging from 1:1 to 5:1 (II–I–8). However, there is no analytical method for selecting the best A/C ratio; baghouse vendors use general guidelines and rely on their previous design experience to select an A/C ratio for a specific industry or application (II–I–8).

Cleaning mechanisms and bag construction (i.e., fabric type, weight, permeability, weave, strength) are interrelated and are typically determined simultaneously in the design process. Woven fabrics are most commonly cleaned by shake or reverse-air cleaning mechanisms, while felted fabrics are almost exclusively cleaned by pulse- or reverse-air jet methods (II–I–8). Of the approximately eight conventional fabric media available, most are eliminated as candidates for a given application by consideration of gas temperature, corrosion wear, abrasion wear, permeability, and dust release characteristics. Therefore, ultimate selection of compatible cleaning/fabric combination is determined by a process of elimination as well as the vendor's previous experience with similar applications (II–I–8).

Inlet dust concentration does not directly influence the size of the baghouse. Size is determined by the gas flow volume to be cleaned and the A/C ratio selected. Inlet dust concentration does affect the size of dust handling systems in a baghouse (e.g., hoppers and conveyors) and the frequency of bag cleaning. Therefore, the variables noted by the Court as "contributing factors" to the amount of dust generated in a rotary kiln do not affect the achievability of the standard.

b. *Electrostatic Precipitators.* In an ESP, particle-laden gas passes between multiple sets of oppositely charged electrodes. Particles in the gas stream acquire a charge from one electrode (usually a wire or pipe) and are attracted to the oppositely charged electrode (the collecting plate). The objective is to make particles migrate from the gas stream to the collecting plates before passing through the ESP unit. The rate of particle migration depends on a number of variables, the most important of which are the particle size, density, resistivity and charge, and the applied voltage. Particles that collect on the plates are periodically dislodged into hoppers by rapping the plates with a hammer mechanism.

Electrostatic precipitator design for lime applications is based on empirical formulas and relationships. Important design parameters are the collection efficiency, collection plate area, and power input (II–A–30). Total collection plate area is calculated from the Deutsch-Anderson equation and is a function of the desired ESP efficiency, the gas flow rate, and the effective migration velocity (EMV) (II–I–6). EMV is determined by vendor experience with a particular dust; it varies as a result of dust properties, especially resistivity and particle size (II–I–6). Power input for a specific unit is determined on an empirical basis and is a function of desired efficiency, gas volume, and particle size and resistivity (II–I–6).

Inlet dust concentration determines both the frequency of rapping (cleaning) and the size of the dust removal systems. Increased inlet dust concentration affects ESP performance and requires a higher power input so that all the particles are charged. Alternatively, a larger collection plate area can compensate for increased dust concentration. Therefore, there are tradeoffs between capital costs and operating (energy) costs. If power input is not increased in response to a higher inlet dust concentration (assuming fixed plate area), particles in the gas stream will not acquire sufficient charge to migrate to the collecting plate before being swept through the ESP by the gas flow. However, ESP units, including those used on rotary lime kilns, are currently designed with automatic power controls that determine the optimum applied power for variable dust concentrations within the unit (II–A–30, II–E–19).

According to theory, there is no lower limit to the particle size that can be captured in an ESP (II–A–9). ESP efficiencies between 99 and 99.998 percent are predicted from empirical data for the control of fly ash particles between 0.2 and 10 μm in diameter. Actual field data for a fly ash system show ESP efficiencies from 99.94 to 99.995 percent (II–D–12). Variations in particle size which may occur at lime plants are not a design problem because the vendors' extensive experience with this industry has made them aware of the size range to be expected (II–E–19). It is not necessary for ESP vendors to know the specific particle size distribution of the dust to be collected; they will design units for the lime industry that are warranted to achieve outlet emission levels of 0.01 gr/acf or less. In actual installations employing good operation and maintenance, outlet dust concentrations of 0.007 gr/acf have been reported (II–A–10, II–D–33).

Issue: Representativeness of Tested Plants

The Court noted in its opinion that the Agency had not confirmed the representativeness of data relied upon to propose a standard. The Court stated:

> From what appears in the record, both variations in dust volume produced and its contributing factors received inadequate attention from the Agency in the development and explanation of this standard. (627 F.2d at 439)

The contributing factors identified by the Court included size and chemical composition of the feedstock, plant operating level, gas velocity, and kiln rotation rate.

The Court identified two additional variables that were discussed in the record but not adequately considered by EPA in the development of the standard—coal usage and particle size. The Court stated:

> The record strongly supports the relevance of coal usage to the efficiency of at least the ESP control method and it also suggests a relationship between particle size and the efficiency of both the ESP and the baghouse control method. Nothing indicates how—if at all—variations in these factors were considered in proposing an "achievable" standard. (627 F.2d at 439)

In the discussion of controllability of dust from rotary lime kilns, the EPA described why neither the dust concentration nor the particle size distribution of the inlet gas stream (to a control device) will affect the achievability of the rotary lime kiln standard. However, the Administrator has investigated the variables noted by the Court that may affect dust generation and has reevaluated the Agency's data base to ascertain the representativeness of the tested plants with respect to these variables.

To assess the representativeness of the variables noted by the Court, the EPA sought new data on the amounts of dust generated, size and chemical composition of feedstocks, plant operating levels, process air flow rates (gas velocity), kiln rotation rates, and particle size distributions from all known lime plants built, modified, or reconstructed since 1977 (hereinafter referred to as "new" plants). Information was requested in writing from 14 plants, and 12 responses were received. The Agency also surveyed new or modified lime plants to determine if process and emission control technology had changed since the development of standards for lime manufacturing plants. No emission tests have been conducted on any of the new or modified rotary kilns found by the Agency; therefore, no new test data were obtained. In addition, EPA sought information from the Industrial Gas Cleaning Institute (IGCI), a national organization of manufacturers of industrial air pollution control equipment, from the NLA, and from a review of the technical literature on lime manufacturing. The IGCI was contacted to determine the relative importance of various parameters in the design of control equipment. Because of its potential as a reservoir of technical information, the NLA was asked to supply available data that supported the claims made in its brief to the Court challenging the promulgated NSPS.

Based on its investigation, the Agency has concluded that the emission data on which the proposed standard is based are representative of the range of conditions (amount of dust generated, feedstock size and chemical composition, plant operating level, gas velocity, and kiln rotation rate) reasonably expected to recur in the industry with respect to the generation of particulate matter. Controlled particulate emission levels at all plants tested by the EPA were less than the level of the proposed standard for particulate matter. Each of these variables is discussed in detail below.

a. *Generation of Dust Emissions.* The Standards Support and Environmental Impact Statement (SSEIS) stated that the mass rate of uncontrolled emissions, also called the "dusting rate," ranged from 22 to 25 percent (pounds of dust per 100 pounds of lime product) at the tested plants (I–K–1). These data were obtained by collecting dust from the baghouse in a dump truck and weighing the dust. The accuracy of this method is doubtful because steady-state conditions such as the moisture content of the dust, the time period involved, and the accuracy of truck scales cannot be assured. Based on its own survey of plants, the NLA stated that dusting rates range from 5 to 35 percent but supplied no supporting data (II–D–22).

To standardize uncontrolled emission rates at the tested plants and the rates from other plants, the Agency calculated dusting rates based on a mass balance involving feed rate, production rate, and limestone chemical composition (II–B–19). These dusting rates are shown in Table 1 for the six plants tested and for five new plants. Dusting rates at the tesfed plants (i.e., plants tested during original NSPS development, Plants A to F) ranged from 5.9 to 14.9 percent. At new or modified plants (i.e., plants subject to the lime NSPS, Plants II to SS), the rate of dust generation ranged from 5.3 to 19.9 percent. Although none of the tested plants exhibited dusting rates as high as 19.9 percent, the Agency believes that there is no real difference between dusting rates of 14.9 and 19.9 percent with regard to the achievability of the proposed standard. The Agency has shown, in the discussion of controllability of dust generated in rotary lime kilns, that the performance of properly designed and operated high efficiency fabric filter and ESP control devices is essentially independent of the inlet dust concentration to be controlled.

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TABLE 1. DUST GENERATED PER UNIT OF LIME PRODUCED

Plant[a]	Feedstock type[b]	Percent dust (by weight)
A2	C	13.5
A3	C	14.0
B	C	14.0
C	D	5.9
D1	D	12.3
D2	D	11.2
E	C	14.9
F	C	14.0
II	N/A	N/A
JJ	C	14.0
KK	C	N/A
LL	C	10.1
MM	C	N/A
NN	D	5.3
OO	C	9.6
PP	N/A	N/A
QQ	C	N/A
RR	C	19.9
SS	D	N/A

$$\text{Percent dust} = \frac{\text{Stone input} - (\text{Lime output} + \text{LOI})^{c}}{\text{Lime output}} \times 100$$

[a]Plants A through F were tested by EPA; Plants II through SS are new, modified, or reconstructed facilities that have not been tested by EPA.
[b]C = calcitic; D = dolomitic.
[c]LOI = loss on ignition; assumed to be 43 percent of stone input (by weight) for calcitic stone and 47 percent for dolomitic stone (II-D-7, 8, 17-19, 24, 25, 30-32, 34; II-I-4, 5).
N/A = not available; insufficient data to calculate.

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b. *Feedstock Size.* No quantitative data on the relationship between feedstock size and dust generation were found during the EPA survey. The opinions of plant operators are not consistent; some operators state that feedstock size does affect dusting, while others state that size is not important (II-B10, 14).

Table 2 presents data on the feedstock size at plants surveyed by the EPA. The data include both calcitic and dolomitic limestone feedstocks. The technical literature on lime manufacturing states that feedstock size for rotary kilns ranges from ¼ to 2½ inches (II-I-4). Data supplied by the NLA (based on a survey of 103 kilns) and the data from Plants A through E cover the same range of feedstock size (II-D-22). Therefore, the Agency considers the tested plants to be representative of the industry.

c. *Feedstock Composition.* Data from the agency's survey show that there is little variation in feedstock composition other than the generic difference between calcitic and dolomitic stone. The data in Table 2 show that, for calcitic limestones, the feedstock composition at plants tested by the Agency (Plants A, B, and E) is nearly identical to the feedstock composition at other plants in the industry. No data were found in the technical literature to show any relationship between the amount of dust generated and the chemical composition of either calcitic or dolomitic limestone. The NLA, when questioned about the relationship between dust generation and feedstock composition, offered no data to show that any relationship exists. Therefore, it is the Agency's judgment that the tested plants are representative of the industry.

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TABLE 2. LIME PLANT FEEDSTOCK AND PRODUCT CHARACTERISTICS[a]

Parameter	Tested plants					New or modified plants									
	A	B	C	D	E	JJ	KK	LL	MM	NN	OO	PP	QQ	RR	SS
Feedstock size (in.)	1/4 - 2	1/4 - 2-1/2	1/2 - 1-1/2	1 - 2-1/4	1/4 - 1-1/2	1/2 - 2-1/2	3/8 - 3/4	3/4 - 2	--[b]	3/4 - 1-1/2	3/8 - 2-1/2	3/8 - 1-1/2	--	1/4 - 2	1/8 - 3/4
Type of rock[c]	C	C	D	D	C	C	C	C	C	D	C	C	C	C	D
Feedstock composition (weight %)															
LOI[d]	43.77	43.53	--	--	43.8	43.03	43.8	41.99	--	46.60	--	--	--[e]	43.86	46.83
CaO	54.37	54.53	--	--	53.8	53.30	53.5	54.39	--	32.56	54.6	--	--	53.85	30.66
MgO	0.99	0.63	--	--	1.4	1.59	1.7	0.39	--	19.38	0.3	--	--	0.17	22.23
SiO_2	0.47	1.02	--	--	--	0.81	--	0.96	--	0.27	--	--	--	0.56	0.17
R_2O_3	0.33	0.61	--	--	--	0.33	0.5	0.48	--	0.60	--	--	--	0.46	0.29

[a] References: II-D-7, 8, 17-20, 24-27, 30-32, 34, 36; II-I-15; I-K-1.
[b] Not available.
[c] C = calcitic; D = dolomitic.
[d] LOI = Loss on ignition.
[e] Source of feedstock is same as for Plant A.

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d. *Operating Capacity.* During emission testing, the production rates at Plants A through E ranged from 86 to 111 percent of design capacity (Table 3). Compliance testing is conducted at the maximum production rate for a given plant (II-I-16). In most cases this production rate will be within approximately 10 percent of design capacity. Therefore, the EPA's tests conducted at ±14 percent of design capacity are considered to be representative of production conditions that would exist during compliance testing of lime plants.

The Agency believes that data cited by the Court regarding operating capacity were misunderstood because they were presented incorrectly in background technical reports used by the Agency during development of the standard. The Court stated:

> * * * in one plant studied an increase in production—from 100 percent to 135 percent of design capacity—resulted in double the rate of emission where a reduction from 100 percent to 75 percent resulted in only an eight percent reduction. (627 F.2d at 437)

Although it is unclear from the above citation, the original source of this information makes it clear that these data actually describe events at two different lime plants—one in the U.S. and one in Canada (II-I-2). The referenced journal article provided no additional information about either of these plants. It is unclear whether the emissions noted are uncontrolled or controlled; the Agency has assumed them to be uncontrolled. In addition, the method(s) used to obtain the emission levels, as well as the validity of the method(s), cannot be determined from the information presented. Therefore, it is incorrect to attribute any change in dust generation from rotary lime kilns to under- or over-capacity production on the basis of limited data from these two plants. In any case, it is the Agency's judgment that Plants A through E were tested under representative conditions with respect to operating capacity.

e. *Process Air Flow Rate.* In this discussion, the Agency, like the Court, has used air (gas) flow rate to indicate air (gas) velocity. Process air flow rate refers to the air required to sustain combustion in the kiln. It is equivalent to the air flow rate entering (or leaving) an emission control device in the absence of the injection of dilution air between the kiln and the control device exhaust stack. Gas velocity through a kiln is a function of the gas flow rate and the cross-sectional area of the kiln. For a given kiln, an increase in gas flow rate would result in an increase in gas velocity. The experience of control device vendors indicates that the smaller particles are entrained even at the lower kiln gas velocities and as gas velocity through a kiln increases, there is an increase in the amount of large particles (easily removed by emission control devices) that become entrained in the gas stream (II-D-33). This observation follows the principles of fluid and particle mechanics (II-I-11).

Air flow rates at plants tested by the Agency (measured at the control device exhaust stack) ranged from 48,100 to 211,000 actual cubic feet per minute (acfm) (Table 3). For new or reconstructed lime plants, the range of (design) air flow rates is from 26,500 to 389,000 acfm (Table 4). Air flow in acfm is a function of the production capacity of a kiln. To compare air flows among kilns at different lime plants, the amount of air per unit of lime produced, e.g., actual cubic feet of air per pound of lime (acf/lb) is a more useful measure than acfm. On this basis, air flows at plants tested by the EPA ranged from 111 to 317 acf/lb (when Plant A was operating with excess dilution air flow on the clean air side of the fabric filter) or from 111 to 165 acf/lb (when Plant A air flow was measured subsequent to sealing leaks in the pressure baghouse). Air flows at new or reconstructed plants range from 88 to 188 acf/lb based on the operating air flows and production rates reported. Therefore, when only the air flow through the kiln is considered (by excluding dilution air entering the fabric filter), the range of air flow per unit of product at the tested plants is representative of the range of air flow per unit of product at new or modified plants.

f. *Kiln Rotation Rate.* The rate of kiln rotation is not an independent variable with respect to dust generation; it is a function of production rate. An increase in production rate is typically associated with an increase in kiln speed. The EPA knows of no studies that evaluate the impact of kiln speed on dust generation from a rotary lime kiln, and no plant operating data were received that demonstrate any relationship between kiln speed and the level of uncontrolled emissions.

Data on the range of design and operating rotation rates for rotary lime kilns are presented in Table 4. The data show that new kilns have been constructed with design rotation rates up to 2 revolutions per minute (rpm). The NLA reported oeprating rates from 0.4 to 1.75 rpm based on a survey of its members (II-D-22). The design rotation rates at plants tested by the EPA range up to 1.6 rpm. During the tests at Plants A and B (the only two plants at which this information was recorded), actual operating rates of 1.1 and 1.3 rpm, respectively, were reported (Table 3).

With respect to the effect of kiln speed, the NLA stated that:

> There is a difference of opinion in the industry on the impact of kiln rotation speed on dust loading. Some contend that attrition loss as dust (dust loss) increases with speed of rotation; others have observed no measurable difference. (II-D-22)

It is the Agency's judgment that, since kiln rotation rate is a function of production rate and the EPA tests were run at representative production rates, its test data were collected under representative kiln rotation rate conditions.

g. *Impact of Coal Burning on Achievability of the Standard.* The use of coal may affect uncontrolled kiln emissions in several ways. The uncontrolled mass emission rate may increase because coal contains more ash than oil or natural gas. The ash may have different properties than those of lime dust (i.e., particle size, resistivity). Kiln emissions will also include sulfur dioxide (SO_2) gas.

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TABLE 3. PLANT OPERATING CONDITIONS DURING EMISSION TESTING[a]

Parameter	Plant						
	A2	A3	B	C	D1	D2	E
Stone feed rate (tph)	37.7-38.6	41.1-44	60	40.4	32.6	26.3	19
Percent of design capacity	91-96	99-106	111	97	100-106	86	86
Production rate (tph)	19-20	20.5-22[b]	30	20.2	14.6-15.4	12.5	9.4
Coal feed rate (tph)	5.7	6.1	5.4	--[c]	322-375[d]	294-316[d]	2.9[b]
Air flow rate x 10^3 (acfm)	211[e]	132	134	180	64-69	66	48
Kiln rotation rate (rpm)	1.1	--[c]	1.3	--[c]	--[c]	--[c]	--[c]

[a]References: I-K-1; I-I-20; II-A-10, 11-13, 24.
[b]Estimated.
[c]Not recorded.
[d]Fuel oil, gallons per hour.
[e]Includes unknown amount of dilution air.

TABLE 4. DESIGN AND CURRENT OPERATING PROCESS DATA[a]

Parameter	Tested plants					New or modified plants									
	A	B	C	D	E	JJ	KK	LL	MM	NN	OO	PP	QQ	RR	SS
Stone feed rate (tph)															
Design	44	54	20.8[b]	29	22	100	6.7	40	79-100	15-30[c]	64	--[d]	29.2	140	28.7
Operating	35-48	35	--	--	20	83	--	40.2	--	15	64	--	--	120	27
Production rate (tph)	20.8	16.8	10.1[e]	15[e]	10	41.5	3.8	20.8	39.5-50[e]	7.5	33	11-12	15[e]	57	16
Fuel feed rate (tph)[f]															
Design	6.8	6.77	--	--	3.3	1-20	1.75	0.6-4.5	8-12	800-1500[g]	0-15	--	8.9	18.8	6.3
Operating	5.7	4	--	--	3.0	13.7	1.75	0.6-4.5	--	800[g]	15	4	--	17	--
Air flow rate x 10^3 (acfm)															
Design	140	143	--	--	65	240	26.5	61.3	185	31-58	--	65	170	420	165
Operating	--	--	--	--	37-45	--	21.5	61.3	--	30	--	50	--	--	--
Kiln rotation rate (rpm)															
Design	0.4-1.6	0-1.3	--	--	0-1.5	0-1.4	0-2	0.1-1.9	0-1.3	0-1.5	0.6-1.6	0-1.4	0.9-1.8	0.7-1.7	0.3-0.9
Operating	1-1.6	0.8-1	--	--	1.2	1.2	--	--	0.9	0.6-1.6	--	1.3-1.8[h]	--	1.3-1.5	0.7-0.8

[a]References: I-K-1; I-I-14, 23; II-D-7, 8, 17-20, 24-27, 30-32, 34, 36.
[b]Per kiln rate calculated from total plant design rate.
[c]Design data are for production from two kilns; only one kiln currently operating.
[d]Not available.
[e]Calculated from design feed rate.
[f]Fuel is coal unless noted otherwise.
[g]Cubic feet per minute of natural gas.
[h]Estimated.

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The Agency's data base included three baghouse-controlled kilns (Plants A, B, and E) firing coal. These three coal-fired kilns represent one half of the facilities tested by the EPA in developing the standard. All three kilns had emissions well below the proposed revised standard. Therefore, since the standard has been set based on these coal-fired plants, the Administrator has concluded that coal firing has been adequately taken into consideration. Tests at these kilns may not represent the full range of emission control conditions because, in all three cases, the plants used low sulfur coal (less than 2 percent sulfur), and the coal ash content was not measured. However, based on studies of other industries, the Administrator has concluded that variations in fuel-firing rate, sulfur content, and ash content beyond the range tested will not affect the ability of a properly designed baghouse to meet the proposed standard.

In one study, where coal was the only particulate source, the variables most likely to affect particulate formation (fuel-firing rate, sulfur content, and ash content) were examined. During a series of 31 sampling runs at Sunbury Station power plant, no statistically significant deviations from the average outlet emission rate (0.00195 gr/dscf) were observed for variations in fuel-firing rate, sulfur content (1.2 to 3.2 percent), or ash content (16.0 to 31.6 percent) (II–A–20, 28). The design characteristics of the Sunbury Station baghouses are very similar to those of lime plants tested by the EPA. It is the Agency's judgment that the performance of baghouses on lime kilns can reasonably be expected to parallel the performance of Sunbury Station baghouse units with respect to variations in fuel-firing rate, sulfur content, and ash content (II–A–28, II–E–18). Therefore, the Administrator has concluded that a properly designed, operated, maintained fabric filter can achieve an outlet grain loading less than that required to meet the proposed standard for lime kilns regardless of the type of coal burned.

While the data base does not include a well-designed and well-operated ESP on a coal-fired kiln, the Agency has concluded that the performance of an ESP is similar to that of a baghouse when coal is fired. Vendors will guarantee the same outlet emission concentration for ESP's on coal-fired kilns as they will for ESP's on kilns that burn gas or oil (II–D–33). Sulfur in the coal favorably alters the electrical properties (resistivity) of the fly ash, causing more efficient collection and removal of the ash in an ESP (II–E–1, II–I–6). Therefore, coal-firing would not necessarily represent the worst-case conditions with respect to controllability of dust.

ESP test data were obtained at Plants C and D on kilns burning natural gas and oil. Emissions at these two plants were controlled to well below the level of the proposed standard (0.068 kg/Mg (0.135 lb/ton) at C, 0.133 and 0.141 kg/Mg (0.266 and 0.282 lb/ton) at D versus 0.30 kg/Mg (0.60 lb/ton) for the proposed standard). The highest emission rate observed was 47 percent of the emission rate that would be allowed under the proposed standard.

Because no data were available, an engineering analysis was performed to determine the effect of coal firing on kiln emissions when an ESP control device is used. To perform this analysis, the EPA computed the amount of fly ash that would be generated at Plants C and D if they fired coal and the level of controlled ash emissions that would result. For the analysis, an ash content in the coal of 20 percent and an ESP efficiency of 99.5 percent (the calculated capture efficiency for lime dust at Plants C and D) were assumed. These assumptions represent a worst-case situation, and this analysis should, therefore, overestimate the impact of coal burning on kiln emissions from these plants. The results showed that controlled particulate emissions from coal firing would be 0.150 kg ash/Mg (0.300 lb ash/ton) of limestone feedstock (II–B–19; II–B–23). Adding this to the measured emissions at Plants C and D, the highest estimated emission level would be 0.291 kg/Mg (0.582 lb/ton) for the kiln at Plant D. Therefore, it is EPA's judgment that a properly designed, operated, and maintained ESP can achieve the proposed standard when coal is burned in a rotary lime kiln.

Of less importance to the Court was the NLA's claim that SO_2 may react with the lime dust to form calcium sulfate ($CaSO_4$) and, therefore, cause the mass weight of the particulate emissions to increase (627 F.2d at 439–440; II–D–22). No data were supplied by the NLA to support this claim. However, any reaction between SO_2 and lime dust that occurs prior to the control device would not affect the controllability of the emissions. The EPA studies show that SO_2 reactions on the filter are insignificant under the conditions found during emission testing of lime kilns by the Agency. Test data show that if the SO_2 concentration is less than 600 parts per million (ppm) and gas moisture content is less than 22 percent, calcium sulfate will not form on the filter in amounts significant enough to affect the mass weight of particulate matter captured (II–B–1, 2, 3). The highest uncontrolled SO_2 level reported for separate EPA tests of SO_2 emissions from lime plants was 450 ppm when coal with a sulfur content of 3.53 percent was burned (I–K–1). In addition, data supplied to the EPA from an NLA survey showed that the sulfur contents of coals burned in 51 kilns ranged from 0.6 percent to only 2.8 percent—well below the 3.53 percent sulfur content of the coal tested by the Agency. Therefore, it is the Agency's judgment that SO_2 reactions on the filter would not prevent the proposed standard from being achieved.

h. *Particle Size.* Table 5 presents all known data for particle size distributions in uncontrolled rotary lime kiln exhaust gases. These data represent particle size tests at 24 plants (reference UU represents composite data from 19 lime plants) and show a wide range of particle sizes in the lime dust—from less than 0.2 to greater than 20.0 μm. As shown in the section on controllability of dust from a rotary lime kiln, fine particles can be more difficult to control than larger particles. Table 5 shows that the largest fraction of fine particles was recorded at Plant D, with 32 percent of the particles less than 2.0 μm in diameter. Plant D, which had emissions of 0.133 and 0.141 kg/Mg (0.266 and 0.282 lb/ton), easily met the proposed mass emission level of 0.30 kg/Mg (0.060 lb/ton).

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TABLE 5. PARTICLE SIZE DISTRIBUTION OF UNCONTROLLED ROTARY LIME KILN EXHAUST GASES FROM 24 PLANTS[a]
(Cumulative percent less than stated size)

Particle diameter	Plant or reference									
(μm)	D[b]		F[c]			RR	TT[d]		UU[e]	NLA
0.2	4.0	--	--	--	--	--	1.4	--	--	--
0.4	6.5	4.8	1.5	0.8	1.5	--	1.8	2.0	--	--
0.6	8.0	5.5	1.9	1.0	1.6	--	2.0	2.2	--	--
0.8	9.0	6.0	2.4	1.2	1.6	--	2.2	2.5	--	--
1.0	13.0	6.5	2.7	1.6	1.7	--	2.5	2.7	--	--
2.0	32.0	16.0	7.5	4.5	4.2	--	3.0	3.1	5-12	3.2
5.0	--	--	--	--	--	29	--	--	9-28	14.0
10.0	--	--	--	--	--	50	--	--	15-48	30.0
20.0	--	--	--	--	--	70	--	--	25-75	50.0

[a] References: II-A-1, 12, 17, 19, 22; II-D-22, 34.
[b] Dolomitic lime, two different kilns.
[c] Three test runs on one kiln.
[d] Two test runs on one kiln.
[e] Composite range for 19 plants.

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It is the Agency's judgment that particle size variations would not prevent the proposed standard from being achieved. This judgment is based on information from control device vendors, the data in Table 5, and the fact that the largest fraction of small particles in the exhaust gas reported in this industry was recorded from an EPA tested plant that easily met the proposed revised standard. Control equipment vendors report that the particle size variations in lime kiln emissions are not great enough to affect baghouse or ESP performance (II-D-33). Vendor experience in the lime industry is sufficient to allow the vendor to design a control system that will achieve the standard for the range of dust particle sizes emitted from rotary lime kilns. Additional justification for this judgment has been presented in the discussion of fabric filter and ESP performance characteristics, under "Controllability of Dust Generated in Rotary Lime Kilns."

Issue: Discarded Emission Data From Plants A and F

In the opinion of the Court, the EPA failed to offer a supportable reason for the exclusion of emission data for Plant A and, to some degree, Plant F from the data base. The Court thought that it is:

> * * * incumbent upon the Agency, at least where it chooses to propose a standard on a data base as apparently limited as this one, to offer some supportable reason for its conclusion that a tested plant, chosen as likely to be well controlled, does not represent best technology * * *.

The Court recognized that:

> * * * the fact that Plant A did not meet the proposed standard does not itself prove the standard is unachievable. However, ignoring Plant A results merely because they were not satisfactory would suggest that the process by which the standard was promulgated was an arbitrary one. (627 F. 2d at 444)

The EPA's reasons for concluding that Plant A did not represent best technology (i.e., large quantities of dilution air on the clean air side of the baghouse and poor performance) were not felt by the Court to be adequately supported or explained.

The Court was less critical of the EPA's analysis of data from Plant F:

> EPA's handling of the Plant F (scrubber) results does not seem as troubling, primarily because neither the trend in the industry nor this standard favor the use of scrubbers for rotary kilns. It was, however, the only scrubber-controlled plant tested and it did not meet the standard. (627 F. 2d at 444)

The EPA hypothesized that a high energy scrubber could meet the standard, citing a non-EPA emission test to support its hypothesis. However, the test conditions were not specified in the emission test referenced.

To determine whether tests at Plant A were representative of well-controlled facilities, the EPA reviewed test data from this plant and revisited Plants A, B, and E to inspect the production process and baghouse units. The Agency also reviewed the literature regarding scrubber and fabric filter design and operation. Additional design and operating data were collected from the NLA, from new or reconstructed lime plants, and from control device vendors. The information collected was then evaluated to determine whether the exclusion of emission data from Plant A was justified.

The EPA has determined that operating and design parameters of the Plant A baghouse are within the range of operating and design parameters typical of best control for baghouses in the lime manufacturing industry. Pollution control vendors confirmed that the design and operating parameters of the baghouse units tested, with the possible exception of the operating pressure drop (Plants A and E), are representative of current technology with respect to fabric filtration (II-D-33). Therefore, the EPA has concluded that the emission data from Plant A should be considered in establishing a particulate emission standard for rotary kilns in the lime manufacturing industry. As explained later, wet scrubbers are not considered best demonstrated control technology. Therefore, the emission data for Plant F have not been used to support the proposed standard.

Design and operating data were collected for the baghouse units (Plants A, B, and E) that were tested during standards development. The data from each plant were compared to data from the remaining plants and also to design data from new or modified plants (II-B-9, 10, 14). The EPA evaluated the design and operating parameters for baghouses in use on rotary lime kilns built since 1977 to determine the design parameters and features that could be expected at new, modified, or reconstructed plants. The data are presented in Tables 6 and 7 along with data for the three baghouses (A, B, and E) previously tested.

The data in Table 6 indicate that the design parameters for 10 of the 11 baghouse units (exception is Plant KK) are within the range that would be expected for a well-designed baghouse on a rotary lime kiln. The baghouse at Plant KK is atypical of the industry at this time because its bags are constructed of Nomex fabric rather than fiberglass, it operates at a higher A/C ratio, and it employes pulse-jet rather than reverse-air cleaning. The other 10 units had comparable A/C ratios, operating temperatures, and cleaning mechanisms.

The one variable that is not consistent is the pressure drop. The variations observed in pressure drop could be due to variations in cleaning cycles, and few data were available on this aspect of the baghouse operations. Operating pressure drops were reported for seven units (three tested plants and four new, modified, or reconstructed plants); of this group of seven, three reported operating at pressure drops of 2.2 inches of water column or less. The range of design pressure drops for both tested and new, modified, or reconstructed plants is from 1 to 8 inches of water column; however, in two of the three cases with design pressure drops as high as 8 inches and where operating data were reported, the operating pressure drops were 2.2 and 3 to 5.5 inches. Vendors indicated that 3 to 5 inches of water column is typical of the pressure drop utilized in fabric filtration of nonmetallic mineral dusts, including lime (II-D-33). The Agency believes that the operating pressure drops of baghouses at the tested plants are representative of the pressure drops for newer, well-designed and well-operated baghouse units.

The data in Table 7 indicate that the fabric filter cloths used at the tested plants are generally within the range that would be used in a well-designed baghouse. The weight, burst strength, and permeability were lower for the cloth used at Plant A than for cloths used at most of the other facilities. However, the Agency believes that the design specifications of the Plant A baghouse are not significantly different from those of the other baghouses investigated.

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TABLE 6. ROTARY LIME KILN BAGHOUSE DESIGN AND OPERATING DATA[a]

Baghouse parameters	Tested plants			New or modified plants							
	A	B	E	JJ	KK	MM	NN	OO	QQ	RR	SS
Design inlet loading	10 gr/acf	12.5 gr/acf	1,110 lb/h (0.93 gr/acf)[b]	20 gr/acf	1.65 gr/acf	2.37 gr/acf	7,500 lb/h[c] (7.5 gr/acf)[b]	--[d]	14 gr/acf	14 gr/acf	5 gr/acf
Inlet temperature (°F)	550	550	550	500	400[e]	550	500	510	600	550	550
Design outlet loading	--	0.025 gr/dscf (0.007 gr/acf)[b]	0.018 gr/acf	--	0.008 gr/acf	0.01 gr/acf	0.30 lb/ton (0.0003 gr/acf)[b]	0.30 lb/ton (0.0007 gr/acf)[b]	0.01 gr/acf	0.01 gr/acf	--
Outlet temperature (°F)	420	--	--	--	280	400	--	450	350-450	350-450	350-450
A/C ratio (n:1)											
Gross	1.75	1.66	1.57	--	7.03	1.67	1.59	1.60	--	--	--
Net	--	--	1.89	--	--	1.91	1.82	1.78	1.8	2.0	1.92
Pressure drop (in. H_2O)											
Design	1-6	8	1.6-1.8	6-8	6	1-4	8	3	1-6	1-6	1-6
Operating	2	3-5.5	1.0-1.8	2.2	--	--	--	3	--	2.5-3.0	3.5-4.0
Cleaning mechanism	RA[f]	RA	RA	RA	PJ[g]	RA	RA	RA	RA	RA	RA
Cleaning cycle (per compartment)											
Cleaning (min)	2.25	1.5	1.76	2	--	--	2	--	--	3.5	--
Dwell (min)	5	2.1	8.8	--	--	--	3	--	--	4	--

[a] References: I-K-1; II-D-8, 17-20, 24-28, 30, 31, 34, 36.
[b] Calculated from given data.
[c] Baghouse is designed to capture emissions from two kilns.
[d] Not available.
[e] Nomex bags in use.
[f] RA = Reverse air.
[g] PJ = Pulse jet.

TABLE 7. ROTARY LIME KILN FABRIC FILTER CLOTH SPECIFICATIONS[a]

Baghouse parameters	Tested plants			New or modified plants						
	A	B	E	JJ	KK	MM	NN	OO	QQ	RR
Material	Fiberglass	Fiberglass	Fiberglass (No. 604)	Fiberglass	Nomex	Fiberglass	Fiberglass	Fiberglass	Fiberglass	Fiberglass
Finish	Silicon-Graphite/Teflon	Silicon-Graphite	Silicon-Graphite	Silicon-Graphite/Teflon	--[b]	+	Silicon-Graphite/Teflon	Silicon-Graphite/Teflon	Silicon-Graphite/Teflon	Silicon-Graphite/Teflon
Weight (oz/yd^2)	8.7	14	12.2	14	--	13	8.2-8.7	13.2	12.7-13.7	11.0
Mullen burst strength (psi)	380	--	--[c]	1,000	--	580-810	--	750	500-550	600
Permeability (cfm/ft^2)	15-20	40-60	50-70	40-60	--	45-60	--	45-60	50-65	45-65
Thread count (per inch)	54x52	48x24	42x30	--	--	44x48	54x52	44x24	46x24	65x33
Weave	Crowfoot	3x1 Twill	3x1 Twill	Twill	--	3x1 Twill	Crowfoot	Crowfoot	Twill	3x1 Twill
Warp yarn	150's 1/2	--	150's 2/2	--	--	75's 1/2	--	--	--	--
Fill yarn	75's 1/0	--	150's 1/4	--	--	75's 1/3[d]	--	--	--	--

[a]References: I-K-1; II-D-8, 17-20, 24-28, 30, 31, 34, 36.
[b]Not available.
[c]Literature value for No. 604 material is 550 psi (II-A-9).
[d]Texturized; fill count 23 to 25 pics per inch.

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It is the Agency's judgment that wet scrubbers do not represent best demonstrated technology for the control of rotary lime kiln emissions. This judgment is explained in a later section of this document ("Basis for Proposed Amendment"). The reasons for this determination include the trend toward use of coal as a process fuel, the high energy costs associated with scrubber operation, and the sensitivity to particle size and variable dust levels in the gas stream. Therefore, emission data from Plant F (wet scrubber) have not been used to establish an emission limit for rotary lime kilns.

Issue: Achievability of the Standard for Lime Hydrators

In remanding the hydrator standard, the court directed the EPA to reevaluate "* * * whether adequate account was taken of significant variables relevant to the standard's achievability" (627 F.2d at 445). The variables noted by the Court as being potentially relevant were particle size and particle surface area. The Court also noted that the EPA had not explained the impact of the use of calcitic versus dolomitic lime or of the feedstock chemical composition on the achievability of the promulgated standard.

To assess the relevance of particle size, particle surface area, and feedstock composition with respect to hydrator operation, the EPA requested design and operating data from all known new lime hydrating plants, from the NLA, and from the IGCI. Two hydrators were observed during the course of baghouse inspections at Plants B and E. Emission test data were requested from a plant with a new hydrator that had been recently tested for State compliance. To dertermine the best demonstrated technology with respect to control of hydrator emissions, the Agency reviewed the technical literature and obtained vendor-related information from the IGCI.

The EPA found that none of the variables noted by the Court are specified in the design of an atmospheric hydrator scrubber, with the possible exception of the type of lime being hydrated. The EPA also found that vendors will design a scrubber for an atmospheric hydrator with only the production rate known. Conditions regarding installation, operation, and maintenance are also specified by the vendor. Therefore, available information indicates that scrubber design for atmospheric hydrators is not dependent on plant-by-plant knowledge of the particle size, surface area, or chemistry of the feedstock found in the lime industry. Furthermore, emission test data obtained from a scrubber on a recently constructed hydrator support the promulgated emission limit and the achievability of the standard. However, this and other test data do not permit the Agency to conclude that the standard for lime hydrators is achievable under the most adverse conditions which reasonably could be expected to recur. Such a conclusion cannot be reached without additional information on particle size distribution. Therefore, for this reason and the reasons discussed in the section titled "Basis for Proposed Amendment," the EPA has decided to delete the standard for hydrators.

The original standard was based on the use of, and test data from, wet scrubbers on atmospheric lime hydrators. The technical literature reports that all atmospheric hydrators produce dry hydrate (hydrated or slaked lime) by the same process. Based on vendor statements, it appears that parameters such as the size of the lime feedstock and the particle size of the hydrated product do not vary appreciably from plant to plant. Lime feedstock is typically ground into pieces between 0.25 and 0.5 inch in diameter called "pebble quicklime" and fed to a mixing chamber where the appropriate amount of water is sprayed on the lime to initiate hydration (II–I–4). The mixture is agitated to promote continuous and uniform contact of water and pebble quicklime and the resulting slurry is fed to a curing chamber where drying is completed. A uniform and restricted particle size range is indicative of high-quality hydrated lime, and the majority of commercial dry hydrates have particle diameters between 1 and 5 μ (II–I–4).

Vendors design scrubber units to control particulate emissions from hydrators based solely on their prior experience with atmospheric hydrator emissions and the historic performance of scrubbers in controlling these emissions (II–E–17, 22). Because of the uniformity of feedstock size and the size of hydrated lime particles, vendors indicate that their previous experience is generally sufficient to establish a warranty at the level of the lime standard without further information on the particle size distribution. Only the size of the unit (production rate) is specified for scrubber design purposes. Wet scrubbers designed in this way have historically provided sufficient emission control on atmospheric hydrators and have become accepted control technology. In many cases, State agencies have not required compliance tests to be performed on new atmospheric hydrators if operators can demonstrate that the hydrator emissions are being controlled by a standard scrubber design, as previously described (II–D–33, II–E–17).

The EPA obtained compliance test data from a scrubber control device on a newly operational atmospheric hydrator. The results of this test, along with test data used in the original data base, are provided in Table 8. The controlled hydrator emissions at these three plants range from 0.04 to 0.06 kg/Mg (0.08 to 0.12 lb/ton) of lime feed. The promulgated standard for lime hydrators is 0.075 kg/Mg (0.15 lb/ton) of lime feed.

Representatives from a hydrator facility indicated that particle surface area affects the reactivity of the finished product but is not important from a scrubber performance standpoint (II–B–10). A vendor experienced in designing wet fan scrubbers for hydrators indicated that scrubber performance on an atmospheric hydrator is not dependent upon particle shape, chemistry, or surface area (II–E–17). The surface area of uncontrolled hydrator exhaust particles has apparently not been the subject of any research published by, or available to, the lime industry (II–D–22, 27).

The Court noted that the original data base included one test where the emissions exeeded the promulgated standard. This was one of three tests at Plant H–B. The average of the three runs, however, was below the promulgated standard. Compliance with a promulgated new source performance standard is based on the arithmetic mean of the results of three runs and not on the individual results of the runs (II–I–16). Thus, the fact that a single test run exceeded the standard does not mean that the facility exceeded the standard.

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TABLE 8. SUMMARY OF HYDRATOR EMISSION DATA[a]

Plant	H-A	H-B	H-C
Process information			
Lime feed rate (tph)	14	17.7	18.7
Hydrate production rate (tph)	17-18	21.7	23.3
Lime type	Calcitic	Calcitic	Calcitic
Particulate emissions			
Probe and filter catch (average)			
gr/dscf	0.0286	0.1856	0.0522
lb/h	1.17	2.08	1.99
lb/ton of feed	0.084	0.117	0.101
kg/Mg of feed	0.042	0.059	0.051

[a]References: I-K-1; II-D-21, 25.

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The controllability of emissions from the hydration of dolomitic limes and calcitic limes may differ. The EPA's test program was conducted entirely on atmospheric hydrators processing calcitic lime. No test data on pressure hydrators or on dolomitic lime hydrators were found by the Agency, and no data from other sources are available to assess the emission levels expected from pressure or dolomitic hydration. No facilities were located that hydrate dolomitic lime atmospherically. Calcitic lime hydrates readily at atmospheric pressure (and no information was located that described other means of hydration for calcitic lime), while dolomitic lime requires extra time and/or pressure for complete hydration. Therefore, the EPA does not believe that the industry will turn to large-scale atmospheric hydration of dolomitic lime.

No emission test data were found for either atmospheric or pressure hydrators of dolomitic lime. There is no indication of industry growth in the pressure hydration of dolomitic lime. There are limited data available for the atmospheric hydration of calcitic lime. There is low growth in the atmospheric hydration of calcitic lime. For these reasons, the Agency has determined that the promulgated standard for lime hydrators should be deleted.

Issue: The Opacity Standard for Rotary Lime Kilns

The Court conclude that the EPA apparently failed to consider some variables in developing the opacity standard for rotary lime kilns. The Court felt these variables:

> * * * were (1) given more careful consideration in the promulgation of earlier opacity standards and (2) given inadequate consideration in the companion mass emission standard. (627 F.2d at 446)

Therefore, the opacity standard for rotary lime kilns was remanded for revision or additional explanation.

The Court's decision to remand derived in part from materials presented to support two arguments raised by the NLA. The NLA argued first that there is an inherent inaccuracy when visible emissions are measured by trained observers using EPA Reference Method 9 and, second, that there is a discrepancy between the opacity standard promulgated for the lime maunfacturing industry and the opacity standards promulgated for the portland cement and asphalt concrete industries. The Court was less concerned with the disparities among the standards for these industries than it was with the apparent differences in which variables that may affect opacity were considered in setting the standards. The Court noted that stack gas exit velocity and particle size and shape were clearly considered in the portland cement and asphalt concrete standards as well as the stack diameter, which appeared to be the only variable considered for the lime standard. Therefore, based on the record, the Court felt that the reasonableness to the rotary lime kiln opacity standard had not been demonstrated.

The EPA reviewed test reports from Plants A through E to confirm that opacity measurements had been properly averaged and reported. The Agency examined the response to the remand of the opacity standards for portland cement plants to review data on the accuracy of qualified observers, the theory of opacity, the effect of variable viewing conditions on accuracy, and smoke school certification procedures. The technical literature was reviewed with respect to variables affecting opacity measurement. Control device vendors were contacted (through the IGCI) to obtain information on variables that affect opacity.

Based on its reexamination of the data base, the Agency has determined that no revision of the rotary lime kiln opacity standard is required. The Agency found that EPA Reference Method 9 is reliable and valid for determining compliance with opacity standards. The same testing methodology used in developing the data base would be used in compliance determinations. The velocity of the gas stream is not a relevant variable upon which the opacity depends. Stack diameter has been considered, and normalization of the data base to the largest diameter stack expected (3.0 m) supports the proposed revised standard. The effects of particle size and shape on opacity have been evaluated, and it has been shown that the data were based on representative conditions and therefore support the achievability of the standard. The opacity data used to support the standard were gathered at the same plants from which the mass emission data were collected. Thus, as these plants have been shown to be representative of the industry, the opacity data are also representative. The opacity of emissions from rotary lime kilns does not vary with the conventional quicklime produced (II–D–22).

The Agency does not believe that EPA Reference Method 9 or its use is at issue in this remand. However, because of ambiguity in footnote No. 103 of the Court opinion, the Agency has reexamined both the use of Method 9 and the opacity data, and a response has been prepared (627 F.2d at 446).

An assessment of the accuracy of opacity determinations by trained observers (EPA Reference Method 9) was made in the EPA's response to the Court remand for standards of performance for portland cement plants (II–A–14). The EPA's assessment was based on results from extensive field tests involving both specially generated plumes and industrial plumes. Based on the review of the data and the results of the field tests, the EPA found that qualified observers "* * * can, with a very high confidence level, read plumes to within the certified error tolerance of 7.5 percent" (II–A–14). Therefore, the EPA concluded that the accuracy of Reference Method 9 had been well established and was within limits considered reasonable and normal by the scientific and engineering community. The EPA continues to believe that the smoke school certification procedures are adequate to ensure the accuracy and precision of opacity measurements by certified observers. Reference Method 9 is valid and reliable for determining compliance with prescribed opacity standards.

In developing the response to the portland cement remand, the EPA evaluated the impact of stack gas exit velocity and stack diameter on opacity. The EPA found that opacity is only affected by stack diameter (i.e., path length), particle concentration, and particle characteristics. Stack gas exit velocity is not an independent variable because it depends on the gas flow rate and stack diameter. Therefore, the EPA concluded that opacity is not dependent upon the velocity at which a gas stream passes through an observer's line of vision (II–A–14). Stack diameter does affect opacity because it governs the path length through which light passes before it reaches an observer. If particle concentration and characteristics remain constant while stack diameter (thus path length) is increased, the opacity of the plume will also increase. In its review of the portland cement opacity standard, the EPA normalized the opacity readings to be representative of the readings that would have been obtained at the largest diameter cement kiln stack found—4.6 meters (m) (i.e., extrapolated the opacity data to that which would have been obtained had a different stack diameter been present). The variation in stack diameters was such that the normalization process raised the maximum opacity reading to nearly 20 percent, and therefore the portland cement opacity standard was raised to that level.

The same normalization process was followed in developing the rotary lime kiln opacity standard (I–K–1). Lime kiln opacity data were normalized to a 3.0 m stack diameter. Table 9 summarizes the normalized visible emissions data including data from Plant A. Each 6-minute average is calculated from 24 consecutive opacity readings taken at 15-second intervals, and each average represents one data point. Of 1,247 data points reported, 71 percent represent averages of 0 percent opacity. Only four readings of the 1,247 normalized averages exceeded 10 percent opacity (maximum of 10.6 percent). Table 10 summarizes the particulate emissions and actual (not normalized) opacity data for the plants tested. The highest raw 6-minute average opacity was recorded at Plant D1 (11.5 percent), and the test report shows that this highest opacity was due to a failure in one field of the ESP during testing. Data obtained during periods of equipment malfunction were not used in developing the data base. The highest raw average opacity observed at the six plants collectively, during normal operation, was 6.7 percent (Plant C).

The largest stack diameter encountered on existing baghouses or ESP's during the EPA testing of rotary lime kilns was 2.4 m (Plant C). However, based on the Agency's survey of industry plans for new manufacturing capacity, 3.0 m stack diameters can be expected for some new plants. When the data are normalized to a 3.0 m diameter stack, more than 99 percent of the 1,247 6-minute averages are less than 10 percent opacity. The Agency, therefore, has concluded that an opacity of 10 percent is reasonble for lime kilns with stack diameters < 3.0 meter.

It is possible that lime manufacturing plants may construct stacks greater than 3.0 m in diameter. However, the Agency believes that such large stack diameters would be atypical. Any lime plants that had stacks greater than 3.0 m in diameter, that did not meet the opacity standard and that also met the mass emission standard, would be eligible for a waiver on the opacity standard under § 60.11(e) of 40 CFR Part 60.

In reviewing the opacity standard, the Agency also considered the effects of particle size and shape on opacity. The analysis shows that the size and shape of particles generated in a rotary lime kiln would not affect the ability of a rotary lime kiln to meet the opacity standard. The basis for this conclusion is explained below.

A typical analysis of calcitic lime emissions from a coal-fired kiln indicates that approximately 25 percent of the dust by weight is raw limestone (total carbonates, $CaCO_3$ and $MgCO_3$), 37 percent of the dust is product lime (total oxides, MgO and CaO), 12 percent is carbon (from the fly ash), and the remaining 26 percent is miscellaneous minerals (II–I–4). A coal-fired kiln was used in the analysis because it should provide worst-case emission conditions because of the presence of fly ash.

Generally, particle sizes at various stages in the lime manufacturing process are within certain size ranges and shape categories. Raw limestone is composed of mineral crystals that are roughly cubic in shape and that range in size from <1 μm up to 1,000 μm (II–D–22; II–I–4, 8). During calcination, limestone crystals become essentially spherical at 900°C, the beginning of dissociation, and are approximately 0.1 μm in diameter. As the temperature in a kiln increases to 1,000°, the 0.1 μm crystals begin to coalesce into larger particles (lime) of approximately 1 μm in diameter. At 1,100°C, these coalesced lime particles are irregular spheres greater than 1 μm and at 1,648°C (the sintering of dead-burned lime), the particles are approximately 100 μm in diameter (II–I–4).

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TABLE 9. SUMMARY OF VISIBLE EMISSIONS DATA AT PLANTS TESTED BY EPA[a]
(All opacity averages are normalized to a 3.0 meter stack diameter)

Plant	Control device	Number of 6-minute averages	Distribution of 6-minute averages (percent opacity) =0	0<X≤5	5<X<10	>10
A	FF[b]	197	184	13	0	0
B	FF	60	58	2	0	0
C	ESP[c]	342	239	5	98	0
D1	ESP	236	138	60	37	1
D2	ESP	193	63	85	43	2
E	FF	219	207	10	1	1
TOTAL		1,247	889	175	179	4

[a]Reference: I-K-1.
[b]Fabric filter (baghouse).
[c]Electrostatic precipitator.

TABLE 10. PARTICULATE EMISSIONS AND OPACITY FROM ROTARY LIME KILNS TESTED BY EPA

Plant	A2	B	C	D1	D2	E
Control device	Baghouse	Baghouse	ESP	ESP	ESP	Baghouse
Stack diameter (m)	2.2	2.0	2.4	1.6	1.6	1.3
Particulate emissions (kg/Mg feed)	0.230	0.111	0.068	0.133	0.141	0.041
Opacity (percent)						
Range of 6-min averages[a]	0-1.3	0-1.0	0-6.7	0-5.8	0-5.8	0-4.6
Range normalized to 3.0 m stack	0-1.7	0-1.5	0-8.3	0-10.6	0-10.6	0-10.3

[a]Reference: I-K-1.

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Fly ash particles generated from pulverized coal combustion exhibit a wide variety of shapes but are generally spherical. The geometric mean particle diameter is 15 μm in uncontrolled emissions and 4 μm in effluents downstream of mechanical collectors (II–I–7).

Based on the above information, it can be concluded that the smallest particle size reasonably expected to occur in uncontrolled kiln emissions is 0.1 μm. The product lime particles fall in the range of 0.1 μm to greater than 1 μm in diameter. The diameter of dust particles derived from the raw limestone feed material ranges from <1 μm up to 1,000 μm. The fly ash component has a mean particle diameter of 15 μm. The primary particle shapes expected to occur are cubic and spherical.

The EPA reviewed the scientific literature with respect to the size and shape of particles that may be expected to contribute to the opacity of kiln emissions and found that maximum light scattering is caused by spherical particles in the 0.2 to 2 μm diameter range (II–A–1, 3). While complete particle size distribution data were not available for all of the plants represented in Table 5, there are sufficient data to allow the EPA to make a judgment about the relationship between particle size and opacity for the lime industry. The particle size distribution data in Table 5 show that between 68 and 97 percent of the lime dust particles are larger than 2.0 μm in diameter. Therefore, the majority of uncontrolled particles are outside the range of particle diameters that cause the greatest light scattering and the greatest opacity.

Moreover, all of the lime plants tested by the Agency met both the mass emission limit and the opacity limit (Table 10). The data in Table 10 include data from a kiln at Plant D. Thirty-two percent of the particles emitted from this kiln were in the size range that is expected to produce the greatest light scattering (i.e., less than 2.0 μm), and yet Plant D easily achieved the promulgated opacity limit and the mass emission limit.

From the above generalized and specific data, the EPA has concluded that the size and shape of particles emitted from well-controlled rotary lime kilns nationwide would not produce variations sufficient to cause any source meeting the mass standard to exceed the opacity standard.

As provided for in § 60.11, 40 CFR Part 60, plant operators may petition the Administrator for an adjustment of the applicable opacity standard if they can show compliance with mass standards for which performance tests were conducted in accordance with § 60.8 CFR (II–I–16). For example, if a lime plant is constructed with unusually large diameter stacks or if conditions are encountered that prevent a plant from meeting the applicable opacity standard (while it is in compliance with other emission limits), the Administrator may establish a revised opacity standard for such a plant. This provision is designed specifically to ensure that the opacity standard is not more stringent than the associated mass emission standard. In its written opinion, the Court acknowledged the usefulness of this built-in flexibility to the opacity regulation (627 F. 2d at 449).

Basis for Proposed Amendment

Under Section 111 of the Clean Air Act, standards of performance must be based on the degree of emission reduction achievable through application of the best technological system of continuous emission reduction which (taking into consideration the cost of achieving such emission reduction, and any nonair quality health and environmental impact and energy requirements) the Administrator determines has been adequately demonstrated. In remanding this standard, the Court did not question the Administrator's selection of the technological basis for the standard nor the reasonableness of applying such controls to new plants in the lime industry. Nor did the Court question the Administrator's original analysis of economic, energy, or environmental impacts. The Agency's economic analysis of the NSPS, which was reported at the original rulemaking, is still valid. The Agency, therefore, in responding the Court's remand, did not reevaluate the economic, energy, and environmental impacts of this standard. The Administrator has determined that fabric filter and ESP control devices represent best demonstrated technology for the control of particulate emissions from rotary lime kilns.

Energy impacts and the associated costs were found to be reasonable. The increase in energy use for a control device on a lime kiln would be approximately 1 percent over the amount required to meet a typical State emission standard.

Nonair quality health and environmental impacts were also found to be reasonable. None of the alternative emission control systems have an adverse impact on water quality. Fabric filters and ESP's have no water effluent. Relative to baseline control, solid waste generation from lime kiln control systems would increase by 0.2 percent. There are no known noise or radiation impacts associated with the proposed standard.

The Agency is proposing that the emission limit for particulate matter from rotary lime kilns be raised from 0.15 kg/Mg (0.30. lb/ton) of limestone feed to 0.30. kg/Mg (0.60 lb/ton) of limestone feed. The proposed amendment to the emission limit is based on the results of seven emission tests from five lime manufacturing plants (Table 11). Controlled emissions from the five plants—three plants using fabric filters and two plants using ESP's—ranged from 0.041 to 0.230 kg/Mg (0.081 to 0.468 lb/ton) of limestone feed. Based on these data, a proposed emission limit of 0.30 kg/Mg (0.60 lb/ton) was selected.

Table 11 summarizes the particulate emission data used to develop the proposed standard for rotary lime kilns. The data in Table 11 show that both a fabric filter and an electrostatic precipitator can be used to achieve controlled outlet emissions less than or equal to 0.23 kg/Mg (0.47 lb/ton) of limestone feed. As explained in previous sections, the plants tested to obtain this data base are representative of the full range of operating characteristics likely to occur in the lime manufacturing industry. Therefore, the Administrator has concluded that the proposed standard of 0.30 kg/Mg (0.60 lb/ton) is achievable by well-controlled lime manufacturing plants. Test data from Plant A (test A2, previously discarded, and test A3, a company-sponsored test done subsequent to the EPA's testing) have been included in the data base.

Test data from Plant F have been excluded from the data base and do not appear in Table 11 because the EPA has determined that wet scubbers do not represent best demonstrated control technology under all plant operating conditions. Compared to the performance of baghouses and ESP's wet scrubber performance is more sensitive to variations in inlet dust concentration and particle size. In addition, the annual operating costs for a scrubber are greater than the annual operating costs for a baghouse or ESP. Under "Controllability of Dust Generated in Rotary Lime Kilns," the Agency has demonstrated that a baghouse or ESP can be used to meet the proposed standard under any conditions reasonably expected to recur in the industry. No circumstances have been identified in which a wet scrubber control device must be used to control particulate emissions from a rotary lime kiln. However, plant operators may elect to use a wet scrubber to meet the proposed standard if they are willing to assume the higher operating costs that would be associated with the high pressure drop likely required for such a device to meet the standard.

The lime hydrator standard is being deleted. With respect to pressure hydrators and the hydration of dolomitic lime, no growth is expected, and no data were available to assess whether these operations could meet the hydrator standard. Data are available indicating the expected performance of wet fan scrubbers used on atomospheric hydrators (Table 8). However, these data do not permit the Agency to conclude that the standard for lime hydrators is achievable under the most adverse conditions which could be expected to recur. Furthermore, the estimated growth of new hydrators is low. Less than one facility per year is expected to be constructed. Also, the clear trend in the industry is to install wet fan scrubbers on hydrators. It is expected that this trend will continue without a Federal standard. Therefore, considering the limited data, the low growth, and the increasing use of wet fan scrubbers, the hydrator standard is being deleted.

In August 1981 NLA provided 61 emission test results from approximately 60 rotary lime kilns controlled by baghouses, ESP's, and wet and dry scrubbers (II–D–40). Of the 22 test results reported for baghouse control devices, only 3 tests indicate controlled emission levels greater than 0.30 kg/Mg (0.60 lb/ton). However, these data have not been included in the data base used for setting the emission limit because vital supporting information was not provided. The required supporting information has been requested from the NLA and any data subsequently received will be considered in promulgating final standards of performance.

There are two major deficiencies in the emission data submitted by the NLA. First, no design data, specific operating information, or opacity data are included. Since standards of performance must be based on the best demonstrated systems of emission reduction, this type of information is vital for determining if individual units are representative of best demonstrated technology with respect to design, operation, and maintenance. Data on visible emissions (opacity) are generally indicative of the level of maintenance applied to a collection device. Therefore, since neither opacity data nor specific operating data were provided, the EPA cannot determine the level of maintenance practiced at the plants tested. Also, no information was presented on the plant names or locations; the NLA considered this information to be confidential. Therefore, the Agency could not use the applicable State emission standards to determine what emission levels the tested control systems were designed to achieve.

Secondly, no emission test reports were submitted. To evaluate test results, information is required on such variables as sampling methodology, number of test runs, gas flow rates, and isokinetic conditions. These variables can have a dramatic effect on the results of an emission test. Without this information, the Agency cannot determine if the NLA's emission tests were conducted under the conditions specified in 40 CFR Part 60, Appendix A, for demonstrating compliance with an emission limit. The Agency invites public comment on these data.

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TABLE 11. SUMMARY OF ROTARY LIME KILN EMISSION DATA AT PLANTS TESTED BY EPA[a]

Plant	A2	A3	B	C	D1	D2	E
PROCESS INFORMATION							
Stone feed rate (tph)	38.2	42.6	60	40.4	32.6	26.3	19
Control equipment	FF[b]	FF	FF	ESP[c]	ESP	ESP	FF
PARTICULATE EMISSIONS							
Probe and filter catch							
gr/acf	0.0097	--	0.012	0.0035	0.015	0.0129	0.0038
gr/dscf	0.0148	0.029	0.022	0.0068	0.036	0.0303	0.0059
lb/h	17.61	17.71	13.3	5.47	8.7	7.42	1.56
lb/ton of feed	0.468	0.412	0.222	0.135	0.266	0.282	0.081
kg/Mg of feed	0.230	0.206	0.111	0.068	0.133	0.141	0.041

[a] References: I-K-1; I-I-20.
[b] FF = Fabric filter (baghouse).
[c] ESP = Electrostatic precipitator.

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In developing the revised standards, the Agency requested emission test data from the NLA and from individual lime companies for new plants built since proposal of the original standard in 1977. The Agency believes that these plants would be representative of the level of emission control that can be achieved by well-designed, well-operated, and well-maintained control devices. As previously discussed, the EPA contacted (in writing) 14 lime plants that were built, modified, or reconstructed since 1977 and was informed by the companies that none of the 14 plants had been tested. At the time of its data submission, the NLA stated that it knew of 16 new plants built in the last 5 years. The NLA's emission test summary included data for five plants having new emission control devices installed after 1976 but did not identify the names or locations of the five plants. Complete test reports and supplementary plant process and operating data have been requested from the NLA for these new facilities. Any additional information received will be considered at promulgation.

In January 1982 NLA representatives expressed concern that the proposed response to the remand did not adequately address process upsets and the associated need to bypass control devices in order to prevent costly damage. Specifically, it was indicated that temperature excursions, while generally infrequent, are nevertheless recognized as an expected occurrance in the operation of lime kilns. Such excursions have the potential to damage fabric filters requiring untimely and costly replacement.

The Agency has received no data on the extent or frequency of such occurrences and no such occurences were reported or observed during the development of this standard. Nevertheless, the Administrator wants to make clear that—to the extent that such upset conditions may occur—the standard is not intended to prohibit an operator from taking necessary steps, including bypassing of control equipment, to avoid damage to equipment. This intent is accomplished through the General Provisions of Part 60 of the Code of Federal Regulations. Paragraph 60.8(c) of these provisions states that "* * * emissions in excess of applicable emission limit during periods of startup, shutdown, and malfunction [shall not] be considered a violation of an applicable standard unless otherwise specified in the applicable standard." Similarly, paragraph 60.11(c) states that opacity standards apply "* * * except during periods of startup, shutdown, or malfunction * * *."

Legal Issues

The Court asked the EPA to reconsider two of the General Provisions applicable to the NSPS generally in light of the new statutory requirement that standards reflect the capabilities of systems of continuous emission reduction (627 F. 2d at 434, n. 54; *see*, Section 111(a)(1), as amended by Pub. L. 95–95). The two provisions are 40 CFR 60.8(f), which provides that a performance test generally consists of the average of three separate runs, and 40 CFR 60.8(c), which provides that performance tests shall not be conducted during periods of startup, shutdown, and malfunction.

In the EPA's view, no amendment to these provisions is legally required. The systems of emission reduction on which NSPS's are based, such as baghouses and ESP's, are "continuous." (By contrast, "intermittent" control systems, which reduce emissions only when atmospheric dispersion conditions are poor, are not "continuous." H.R. Rep. No. 294, 95th Cong., 1st Sess. 81–92 (1977).) However, even the performance of continuous systems is influenced by startups, shutdowns, and malfunctions. Also, the performance of continuous systems may be best characterized by test methods that average data collected over a period of time. (*See*, *Sierra Club* v. *Costle*,—F. 2d—, 15 ERC 2137, 2192–2193 (D.C. Cir. 1981).)

It is true that there are statements in the legislative history of the 1977 amendments to the Clean Air Act that "averaging" would be forbidden in determining compliance with an NSPS. These statements, however, did not refer to the Agency's long-standing policies of averaging test runs and allowing for startups, shutdowns, and malfunctions and do not reflect any Congressional dissatisfaction with those policies.

Public Hearing

If requested, a public hearing will be held to discuss the proposed standards in accordance with Section 307(d)(5) of the Clean Air Act. Persons wishing to make oral presentations should contact the EPA at the address given in the **ADDRESSES** section of this preamble. Oral presentations will be limited to 15 minutes each. Any member of the public may file a written statement before, during, or within 30 days after the hearing. Written statements should be addressed to the Central Docket Section address given in the **ADDRESSES** section of this preamble.

A verbatim transcript of the hearing and written statements will be available for public inspection and copying during normal working hours at the EPA's Central Docket Section in Washington, D.C. (see **ADDRESSES** section of this preamble).

Docket

The docket is an organized and complete file of all the information submitted to or otherwise considered in the development of this proposed rulemaking. The principal purposes of the docket are (1) to allow interested parties to readily identify and locate documents so that they can effectively participate in the rulemaking process, and (2) to serve as the record in case of judicial review.

Miscellanous

Section 317 of the Clean Air Act requires the Administrator to prepare an economic impact assessment of "revisions (of NSPS's) which the Administrator determines to be substantial * * *" Section 317(a). This amendment is not substantial since it is a technical adjustment that simply conforms the standard to the capabilities of the control technologies on which the promulgated standard was based. Therefore, no economic impact assessment of the proposed amendment has been prepared. The Administrator prepared a substantial economic analysis of the promulgated standard in the original rulemaking. The economic impacts are essentially as described in the original economic analysis (I-G-2, I-K-1).

Executive Order 12291 requires that the EPA determine whether a regulation is a "major rule" and, therefore, subject to the requirements of a regulatory impact analysis (RIA). This standard, as it would be amended by this proposal, would result in none of the adverse economic effects set forth in Section 1 of the Order as grounds for finding a regulation to be a "major rule." As reported in the notice of proposed rulemaking in 1977, the annualized costs in 1982 were estimated at $5 million, much less than the $100 million established as the first criterion for a major regulation in the Order. The estimated price increase of 80 cents per megagram of lime produced (an increase of approximately 2.6 percent) is not considered a "major increase in costs or prices" specified as the second criterion in the Order. The economic analysis did not indicate any significant adverse effects on competition, investment, productivity, employment, innovation, or the ability of U.S. firms to compete with foreign firms (the third criterion in the Order).

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 "Standards Support and Environmental Impact Statement Volume 1: Proposed Standards of Performance for Lime Manufacturing Plants (EPA-450/2-77-007a)." The 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 were evaluated in order to determine the least costly way to reduce emissions and to ensure 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 facility affected by the standard, both on an average and incremental basis. The incremental cost was estimated to be about $350 per ton of particulate removed, which compares favorably with particulate control at other industrial sources. At these sources, costs typically range up to $1,000 per ton and in some cases may exceed $2,000 per ton. Additional detail on this analysis can be found in the dockets (II-B-28).

The provisions of 5 U.S.C. 605(b) require the Administrator to prepare a regulatory flexibility analysis (RFA) or to certify that a proposed rule will not (if promulgated) have a significant economic impact on a substantial number of small entities. This amendment will not have significant impacts because it is a technical amendment that simply conforms the standard to the capabilities of the control technologies on which the promulgated standard was based.

The Paperwork Reduction Act of 1980 (Public Law 95-511) requires clearance from the Office of Management and Budget (OMB) of certain public reporting/recordkeeping requirements before this rulemaking can be promulgated as final. The report/recordkeeping requirements associated with this standard have been submitted to OMB for approval.

List of Subjects in 40 CFR Part 60

Air pollution control, Aluminum, Ammonium, 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: August 27, 1982.

John W. Hernandez,

Administrator.

Proposed Regulation

PART 60—STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES

Proposal to amend Subpart HH, Part 60 of Chapter I, Title 40 of the Code of Federal Regulations by adding §§ 60.340 through 60.344 to read as follows:

§ 60.340 Applicability and designation of affected facility.

(a) The provisions of this subpart are applicable to rotary lime kilns used in the manufacture of lime.

(b) The provisions of this subpart are not applicable to facilities used in the manufacture of lime at kraft pulp mills.

(c) Any facility under paragraph (a) of this section that commences construction or modification after May 3, 1977, is subject to the requirements of this part.

§ 60.341 Definitions.

As used in this subpart, all terms not defined herein shall have the same meaning given them in the Act and in the General Provisions.

(a) "Lime manufacturing plant" means any plant which uses a lime rotary kiln to produce lime product from limestone by calcination.

(b) "Lime product" means the product of the calcination process including, but not limited to, calcitic lime, dolomitic lime, and dead-burned dolomite.

(c) "Rotary lime kiln" means a unit with an inclined rotating drum that is used to produce a lime product from limestone by calcination.

§ 60.342 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 rotary lime kiln any gases which:

(i) Contain particulate matter in excess of 0.30 kilogram per megagram of limestone feed (0.060 lb/ton).

(ii) Exhibit 10 percent opacity or greater when exiting from a dry emission control device.

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

§ 60.343 Monitoring of emissions and operations.

(a) The owner or operator subject to the provisions of this subpart shall install, calibrate, maintain, and operate a continuous monitoring system, except as provided in paragraph (b) of this section, to monitor and record the opacity of a representative portion of the gases discharged into the atmosphere from any rotary lime kiln. The span of this sytem shall be set at 40 percent opacity.

(b) The owner or operator of any rotary lime kiln using a wet scrubbing emission control device subject to the provisions of this subpart shall not be required to monitor the opacity of the gases discharged as required 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 accurate within ±250 pascals (one inch of water).

(2) A monitoring device for continuous measurement of the scrubbing liquid supply pressure to the control device. The monitoring device must be accurate within ±5 percent of the design scrubbing liquid supply pressure.

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

(d) 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 lime kiln subject to paragraph (a) of this section is 10 percent or greater.

§ 60.344 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 § 60.322(a) as follows:

(1) Method 5 for the measurement of particulate matter;

(2) Method 1 for sample and velocity traverses;

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

(4) Method 3 for gas analysis;

(5) Method 4 for stack gas moisture; and

(6) Method 9 for visible emissions.

(b) For Method 5, the sampling time for each run shall be at least 60 minutes, and the sampling rate shall be at least 0.85 std m^3/h, dry basis (0.53 dscf/min), except that shorter sampling times, when necessitated by process variables or other factors, may be approved by the Administrator.

[FR Doc. 82-24143 Filed 9-1-82; 8:45 am]
BILLING CODE 6560-50-M