ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 410

[FRL 1291-1]

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

AGENCY: Environmental Protection Agency (EPA).

ACTION: Proposed regulation.

SUMMARY: EPA proposes regulations to limit the discharge of effluents and the introduction of pollutants into publicly owned treatment works from facilities that produce intermediate and finished textile products from various types of fiber, yarn, or fabric. The purpose of these regulations is to provide effluent limitations guidelines for "best available technology" and "best conventional technology," and to establish new source performance standards and pretreatment standards, under Sections 301, 304, 306, and 307 of the Clean Water Act.

The SUPPLEMENTARY INFORMATION section of this preamble describes the legal authority and background, technical and economic bases, and other aspects of the proposed regulations. It also presents a summary of comments on the draft technical development document, which was circulated during November 1978, and solicits comments on specific areas of interest.

Many abbreviations and acronyms are used throughout this notice to avoid excessive narrative; a list of these and their definitions is set forth in Appendix A. Definitions of various terms, possibly unfamiliar to some readers, also are provided in that appendix.

Support for these proposed regulations is in three major documents available from EPA. Analytical methods are discussed in *Sampling and Analysis Procedures for Screening of Industrial Effluents for Toxic Pollutants.* EPA's technical conclusions are detailed in the *Development Document for Proposed Effluent Limitations Guidelines, New Source Performance Standards and Pretreatment Standards for the Textile Mills Point Source Category.* The Agency's economic analysis is found in *Economic Impact Analysis of Proposed Effluent Limitations Guidelines, New Source Performance Standards and Pretreatment Standards for the Textile Mills Point Source Category.*

DATES: A period of sixty days from the date of publication in the Federal Register will be allowed for submission of comments on this proposal. Comments by December 28, 1979.

ADDRESS: Send comments to: James R. Berlow, Effluent Guidelines Division, Environmental Protection Agency, 401 M Street SW., Washington, D.C. 20460. Attention: EGD Docket Clerk, Textile, (WH-552). A copy of the supporting information and all public comments submitted in response to this proposal will be available for inspection and copying at the EPA Public Information Reference Unit, Room 2404 (Rear) PM-213. (EPA Library), 401 M Street SW., Washington, D.C. 20460. The EPA information regulation (40 CFR Part 2) provides that a reasonable fee may be charged for copying.

FOR FURTHER INFORMATION CONTACT: Technical information and copies of technical documents may be obtained from James R. Berlow at the address listed above after November 16, 1979 or call (202) 426-2554. The economic analysis may be obtained from Ms. Jean Noroian, Water Economics Branch (WH-586), Environmental Protection Agency, 401 M Street SW., Washington, D.C. 20460, Tel. (202) 426-2617, after November 23, 1979.

SUPPLEMENTARY INFORMATION:

Organization of This Notice.

I. Legal Authority

The regulations described in this notice are proposed under 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. 92-517) (the "Act"). These regulations are also proposed in compliance with 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. Background

A. *The Clean Water Act.* 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)). By July 1, 1977, existing industrial dischargers were required to achieve "effluent limitations requiring the application of the best practicable control technology currently available (BPT)," (Section 301(b)(1)(A)). By July 1, 1983, these dischargers were required to achieve "effluent limitations requiring the application of the best available technology economically achievable (BAT), which will result in reasonable further progress toward the national goal of eliminating the discharge of pollutants," (Section 301(b)(2)(A)). New industrial direct dischargers were required to comply with section 306, new source performance standards (NSPS), based on best available demonstrated technology. New and existing dischargers to publicly-owned treatment works (POTWs) were subject to pretreatment standards under sections 307(b) and (c) of the Act. While the requirements for direct dischargers were to be incorporated into National Pollutant Discharge Elimination System (NPDES) permits issued under section 402 of the Act, pretreatment standards

were made enforceable directly against dischargers to POTWs (indirect dischargers).

Although section 402(a)(1) of the 1972 Act authorized the setting of requirements for direct dischargers on a case-by-case basis in the absence of regulations, Congress intended that, for the most part, control requirements would be based on regulations promulgated by the Administrator of EPA. Section 304(b) of the Act required the Administrator to promulgate regulations providing guidelines for effluent limitations setting forth the degree of effluent reduction attainable through the application of BPT and BAT. Moreover, Sections 304(c) and 306 of the Act required promulgation of regulations for NSPS, and Sections 304(f), 307(b), and 307(c) required promulgation of regulations for pretreatment standards. In addition to these regulations for designated industry categories, Section 307(a) of the Act required the Administrator to promulgate effluent standards applicable to all dischargers of toxic pollutants. Finally, Section 501(a) of the Act authorized the Administrator to prescribe any additional regulations "necessary to carry out his functions" under the Act.

The Agency was unable to promulgate many of these toxic pollutant regulations and guidelines within the time periods stated in the Act. In 1976, EPA was sued by several environmental groups and, in settlement of this lawsuit, EPA and the plaintiffs executed a "Settlement Agreement," which was approved by the Court. This Agreement required EPA to develop a program and adhere to a schedule for promulgating, for 21 major industries, BAT effluent limitations guidelines, pretreatment standards, and new source performance standards for 65 "priority" pollutants and classes of pollutants. (See *Natural Resources Defense Council, Inc. v. Train*, 8 ERC 2120 (D.D.C. 1976), modified 12 ERC 1833 (D.D.C. 1979).

On December 27, 1977, the President signed into law the Clean Water Act of 1977. Although this law makes several important changes in the federal water pollution control program, its most significant feature is its incorporation into the Act of many of the basic elements of the Settlement Agreement program for toxic pollution control. Sections 301(b)(2)(A) and (b)(2)(C) of the Act now require the achievement by July 1, 1984, of effluent limitations requiring application of BAT for "toxic" pollutants, including the 65 "priority" pollutants and classes of pollutants which Congress declared "toxic" under section 307(a) of the Act. Likewise, EPA's programs for new source performance standards and pretreatment standards are now aimed principally at toxic pollutant controls. Moreover, to strengthen the toxics control program, Congress added a new section 304(e) to the Act, authorizing the Administrator to prescribe what have been termed "best management practices (BMPs)" to prevent the release of toxic 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.

In keeping with its emphasis on toxic pollutants, the Clean Water Act of 1977 also revised the control program for non-toxic pollutants. Instead of BAT for "conventional" pollutants identified under Section 304(a)(4) (including biological oxygen demand, suspended solids, fecal coliform and pH), the new Section 301(b)(2)(E) requires achievement by July 1, 1984, of "effluent limitations requiring the application of the best conventional pollutant control technology" (BCT). The factors considered in assessing BCT include the reasonableness of the relationship between the costs of attaining a reduction in effluents and the effluent reduction benefits derived, and the comparison of the cost and level of reduction for an industrial discharge with the cost and level of reduction of similar parameters for a typical POTW (Section 304(b)(4)(B)). For non-toxic, nonconventional pollutants, Sections 301(b)(2)(A) and (b)(2)(F) require achievement of BAT effluent limitations within three years after their establishment, but not later than July 1, 1987.

The purpose of these regulations is to provide effluent limitations guidelines for BAT and BCT and to establish NSPS and pretreatment standards for existing and new sources (PSES, PSNS) under Sections 301, 304, 306, and 307 of the Clean Water Act.

B. *Prior EPA Regulations.* EPA promulgated BPT, BAT, NSPS, and pretreatment standards for new sources (PSMS) for the Textile Mills Point Source Category on July 5, 1974, (39 FR 24736; 40 CFR Part 410, Subparts A–G). The BAT regulations were challenged, and on January 3, 1975, the Fourth Circuit of the United States Court of Appeals ordered EPA to reconsider BAT in light of technological and economic data being developed by the textile industry. The order resulted in an EPA grant (No. R–804329) to cooperatively develop this data. EPA promulgated pretreatment standards for existing sources (PSES) on May 26, 1977, (42 FR 26979; 40 CFR Part 410, Subparts A–G).

The regulations proposed in this notice include BCT and revised BAT regulations and supersede prior NSPS, PSNS, and PSES regulations.

C. *Overview of the Industry.* The U.S. textile industry is covered by two of the twenty major groups of manufacturing industries in the U.S. Department of Commerce, Bureau of the Census Standard Industrial Classification (SIC). They are Textile Mill Products, Major Group 22, and Apparel and other Textile Products, Major Group 23. The Textile Mill Products group includes 30 separate industries that manufacture approximately 90 classes of products. The Apparel and Other Textile Products group includes 33 separate industries that manufacture some 70 classes of products. That part of the industry covered by this proposed regulation is Major Group 22; Major Group 23 has been recommended for exclusion from regulation based on Paragraph (a)(iii) of the Revised Settlement Agreement (see Pollutants and Subcategories Not Regulated).

The Textile Mills Point Source Category covers facilities principally engaged in receiving and preparing fibers; transforming these materials into yarn, thread, or webbing; converting the yarn and web into fabric or related products; and finishing these materials at various stages of the processing. Many produce a final consumer product such as thread, yarn, bolt fabric, hosiery, towels, sheets, carpet, etc., while the rest produce a transitional product for use by other establishments in Major Groups 22 and 23. There are approximately 7,200 textile mills in the U.S., of which approximately 2,000 have a process-related wastewater discharge. Between 1,100 and 1,200 have a significant amount of discharge and are considered to be the most important for the purposes of this proposed regulation. Nearly 80 percent of the facilities that have a process-related discharge are located in the Mid-Atlantic and Southern regions of the country. The remaining 20 percent are distributed about equally between the New England region and the North Central and Western regions. Some industry segments, particularly yarn manufacturing, weaving, and carpet manufacturing, are heavily concentrated in a few southeastern states.

While the industry traditionally has consisted of a large number of small, family-owned, closely-held, highly-specialized facilities, the industry today also includes many large, publicly-owned, diversified corporations. Approximately 34 percent of the plants

currently represent 80 percent of the industry shipments. The establishments in the New England area tend to be older structurally while the establishments in the Southern states tend to be fairly modern. However, it is common for older facilities in the industry to install modern equipment or modern facilities to install well-functioning old equipment. While many of the subcategories in the industry have implemented unique technological advances, the general cause for change has been a shift to producing man-made fibers.

During the past ten years, the industry has maintained a steady rate of sales growth that has averaged approximately seven percent annually. In spite of this growth, the industry consistently ranks among the lowest in profitability, with the industry's after tax annual returns on sales averaging 2.3 percent, 40 to 50 percent less than the average for all manufacturing industries. Reasons for the low levels of profitability include the inability to adapt quickly to consumer preference changes, excess capacity and production resulting in price-cutting competition, and, most importantly, increased competition from imported fabric and consumer apparel. Capital expenditures traditionally have been below the industry's levels of depreciation. In the past two years, these expenditures have increased; however, because of the industry's weak profit performance, expectations are that future funds for such expenditures will be more difficult to obtain. The industry's continued viability has depended on its expenditures for improvement in productivity.

The future of the industry depends upon several factors. Among these, a major concern is the growth of textile imports in U.S. markets. In recent years, the growth rates of imports have exceeded the growth rates of domestic products. Thus, the industry's market share has decreased. Other major factors affecting the industry's future performance include proposed cotton dust and noise regulations of the Occupational Safety and Health Administration (OSHA) and increases in the costs of energy, raw materials, and labor. The Agency expects six percent fewer plants in 1984 than existed in 1978. EPA does not expect the opening of any new Wool Scouring Facilities, and expects the opening or construction of small plants in other subcategories to be unlikely. The Agency anticipates that any new plants will likely be integrated facilities.

Production in the industry ranges from less than 1,000 pounds of finished product per day to over 700,000 pounds per day, with a majority of the plants processing less than 50,000 pounds of product per day. Estimated total industry production is 45 million pounds per day, or approximately 14 billion pounds annually. The value of the products produced is over 40 billion dollars annually, and the industry employs nearly one million people.

Many of the facilities are integrated and perform dry, low water use, and major wet-processing operations. Principal dry operations include spinning, tufting, knitting, and weaving. Principal low water use operations include slashing, web formation (nonwoven manufacturing only), bonding, adhesive processing, coating, and functional finishing. Major wet operations include scouring, carbonizing, fulling, desizing, mercerizing, bleaching, dyeing, and printing. Detailed descriptions of the processing operations and products are provided in Section III of the Development Document.

Water is essential to textile processing and is used in significant amounts in most wet-processing operations. Water usage rate (gal/lb of product) varies substantially among the subcategories (see Industry Subcategorization) and facilities within each subcategory. The typical water usage rates (median values) for the subcategories range from 1.1 gallons per pound of product to 34.1 gallons per pound of product, with an average for all subcategories (typical values) of approximately 12 gallons per pound of product.

Wastewater discharge from the wet-processing plants in the industry ranges from a few thousand gallons per day to over 7 million gallons per day. Among the wet-processing subcategories, the typical (median) discharge ranges from approximately 50,000 gallons per day to over 500,000 gallons per day. The average plant discharge (wet processing only) is approximately 820,000 gallons per day for direct dischargers and 380,000 gallons per day for indirect dischargers. Estimated total wastewater discharge is 525 million gallons per day; over 150 billion gallons annually. Approximately 80 percent of the facilities are indirect dischargers and discharge wastewater to POTW; the remaining treat their wastewater on-site before discharging the effluent to a receiving water body. A small number of facilities recycle their treated effluent.

The wastewater characteristics vary substantially from subcategory to subcategory (see Development Document; Section V), but in general, the wastes are complex mixtures of natural and synthetic organic materials and inorganic chemicals. The wastes are high in BOD5 and COD, with the typical concentrations for the various subcategories ranging from 170 to 2,270 mg/l for BOD5 and from 550 to 7,030 mg/l for COD. TSS values are typically one-third of the BOD5 values, and color and oil and grease are problems in some subcategories. Toxic pollutants are likely to be present, although at generally low concentrations.

The most significant pollutants and pollutant parameters in terms of occurrence and concentration include: (1) 17 organic and 11 metallic toxic pollutants and cyanide (see Appendix B); (2) conventional pollutants designated in the Act (BOD5, TSS, oil and grease, and pH); and (3) nonconventional pollutants (COD and color).

III. Scope of This Rulemaking and Summary of Methodology

These proposed regulations significantly expand the water pollution control requirements for the textile industry. In EPA's initial (June 1974) rulemaking, emphasis was placed on the achievement of BPT, BAT, and NSPS based on control of familiar (i.e., "classical") pollutants. In 1977, EPA proposed PSES based on compliance with general prohibitive waste provisions. By contrast, in this round of rulemaking, EPA's efforts are directed toward instituting BCT and BAT effluent limitations, new source performance standards, and pretreatment standards for existing and new sources, that will result in reasonable further progress toward the national goal of eliminating the discharge of all pollutants ("classical" and toxic).

In general, BCT represents the best control technology for conventional pollutants that is reasonable in cost and effluent reduction benefits. It replaces BAT for conventional pollutants. BAT represents, at a minimum, the best economically achievable performance in any industrial category or subcategory, and, as a result of the Clean Water Act of 1977, emphasis has shifted from control of "classical" pollutants to control of a lengthy list of toxic substances. New source performance standards represent the best available demonstrated technology for control of all pollutants, and pretreatment standards for existing and new sources represent the best economically achievable performance for control of pollutants that pass through, interfere with, or are otherwise incompatible with the operation of POTWs, including management of sludge.

In the 1977 legislation, Congress recognized that it was dealing with areas of scientific uncertainty when it declared the 65 "priority" pollutants and classes of pollutants "toxic" under Section 307(a) of the Act. The "priority" pollutants have been relatively unknown outside of the scientific community, and those engaged in wastewater sampling and control have had little experience dealing with these pollutants. In addition, these pollutants often appear and have toxic effects at concentrations which severely tax current analytical techniques. Even though Congress was aware of the state-of-the-art difficulties and expense of "toxics" control and detection, it directed EPA to act quickly and decisively to detect, measure, and regulate these substances. Thus, with the passage of the 1977 legislation, the Nation's water pollution control program was thrust toward the frontiers of science.

EPA's implementation of the Act required a complex development program, described in this section and subsequent sections of this notice. Initially, because in many cases no public or private agency had done so, EPA and its laboratories and consultants had to develop analytical methods for toxic pollutant detection and meassurement, which are discussed under sampling and analytical program. EPA then gathered technical and financial data about the industry, which are summarized under Data Gathering Efforts. With these data, the Agency proceeded to develop these proposed regulations.

First, EPA studied the textile industry to determine whether differences in raw materials, final products manufacturing processes, equipment, age and size of manufacturing facilities, water use, wastewater constituents, or other factors required the development of separate effluent limitations and standards of performance for different segments of the industry. This study required the identification of raw waste and treated effluent characteristics, including: (1) The sources and volume of water used, the manufacturing processes employed, and the sources of pollutants and wastewaters within the plant, and (2) the constituents of wastewaters, including toxic pollutants. (See Industry Subcategorization.) EPA then identified the constituents of wastewaters which should be considered for effluent limitations guidelines and standards of performance, and statistically analyzed raw waste constituents, as discussed in detail in Section V of the Development Document.

Next, EPA identified several distinct control and treatment technologies, including both in-plant and end-of-process technologies, which are in use or capable of being used to control or treat textile industry wastewater. The Agency compiled and analyzed historical and newly generated data on the effluent quality resulting from the application of these technologies. The long-term performance, operational limitations, and reliability of each of the treatment and control technologies were also identified. In addition, EPA considered the non-water environmental impacts of these technologies, including effects on air quality, solid waste generation, and energy requirements.

The Agency then estimated the costs of each control and treatment technology for the various industry subcategories from unit cost curves developed by standard engineering analysis as applied to the specific textile wastewater characteristics. EPA derived unit process costs from model plant characteristics (production and flow) applied to each treatment process unit cost curve (i.e., activated sludge, chemical coagulation/sedimentation, dissolved air flotation, multi-media filtration, activated carbon adsorption, and ozonation). These unit process costs were combined to yield total cost at each treatment level. After confirming the reasonableness of this methodology by comparing EPA cost estimates to treatment system costs supplied by the industry, the Agency evaluated the economic impacts of these costs. Costs and economic impacts are discussed in detail under the various technology options, and in the section of this notice entitled Costs, Effluent Reduction Benefits, and Economic Impacts.

Upon consideration of these factors, as more fully described below, EPA identified various control and treatment technologies as BCT, BAT, NSPS, PSES, and PSNS. The proposed regulations, however, do not require the installation of any particular technology. Rather, they require achievement of effluent limitations representative of the proper application of these technologies or equivalent technologies. A plant's existing controls should be fully evaluated, and existing treatment systems fully optimized, before commitment to any new or additional end-of-pipe treatment technology.

The effluent limitations for BCT, BAT and NSPS are expressed as mass limitations (lbs/1000 lbs of finished product) and are calculated by multiplying three values: (1) Effluent concentration determined from analysis of control technology performance data; (2) typical wastewater flow for each subcategory; and (3) a process or treatment variability factor. This basic calculation was performed for each regulated pollutant or pollutant parameter for each subcategory of the industry. Effluent limitations for PSES and PSNS are expressed as allowable concentrations in milligrams per liter (mg/l). Mass limitations are also provided as guidance for POTWs that may wish to impose them along with, or instead of, the concentration limitations.

IV. Data Gathering Efforts

The data gathering efforts involved several distinct, detailed activities which are summarized here. All aspects of the program are described in detail in Section III of the Development Document and Section I of the Economic Impact Analysis.

In general, the program involved: (1) Review and use of existing information in the administrative record; (2) distribution and evaluation of detailed industry surveys; (3) collection of historical wastewater data; (4) plant visits and meetings with industry trade associations and other representatives of the industry; and (5) review of the available literature.

The administrative record for technical information included the original Development Document (EPA-440/1-74-022-a, June 1974) and its appendices, and the November 1976, Draft Development Document for Pretreatment Standards(EPA Contract No. 68-01-3289, Task Order 6) and its appendices. The latter document and appendices were especially useful because they provided a considerable amount of timely data about the industry. The administrative record for economic information included the Economic Analysis of Proposed Effluent Guidelines (EPA 230/1-73-028, September 1973) and the Economic Analysis of Pretreatment Standards for the Textile Industry (EPA 440/1-77-009, July 1977) prepared in conjunction with the pretreatment standards.

The industry survey for technical information was conducted during the first half of 1977. The survey involved the following phases of activity: (1) Developing a master list of textile mills; (2) contacting mills on the master list by letter to outline the purpose and intent of the survey; (3) contacting mills on the master list by telephone in order to assess the value of available wastewater information and to gather basic facility information; (4) distributing detailed survey questionnaries; and (5) retrieving and analyzing the questionnaires. The original master list included

approximately 2,600 facilities. Following the telephone survey, the list was reduced to 1,973 facilities by removing 627 entries that were found to be offices, services, dry-processing operations, or facilities that were no longer in the business of manufacturing textiles. Of the remaining facilities on the list, 808 were classified as low water use processing. These were given secondary consideration in the survey, since they generate relatively small quantities of pollutants. The remaining 1,165 facilities were classified as important wet-processing plants and were given primary consideration in the survey. Detailed portfolios were distributed to approximately 550 of these facilities, based on their reporting of available wastewater characterization data during the telephone survey; 538 completed portfolios were returned to the Agency. The low-water-use processing facilities were surveyed separately and 315 detailed portfolios were received from a random distribution to approximately half of them.

Data for the economic analysis of the industry were obtained from a survey program under authority of Section 308 of the Act. Questionnaires seeking production costs, balance sheet and income data, and costs for existing pollution abatement systems were distributed to 532 facilities. Of these, 308 surveys were returned from the first mailing, with about 208 of these being from wet-processing facilities. The 224 nonrespondents were sent follow-up surveys and 95 additional responses were received; 74 were from wet-processing facilities. The economic survey data were supplemented by data from government publications, industry members and trade associations, publicly available financial studies and surveys, and visits to 15 plants.

Wastewater characterization data were obtained, when available, directly from the textile facilities as part of the industry survey, from EPA regional offices and state water pollution control agencies, and, for indirect dischargers, from POTWs. The data collected provide very good characterization of the raw wastes and treated effluents for the various subcategories of the industry.

EPA conducted approximately 100 plant visits during the development of the technical information leading to these regulations to obtain information on plant operations or to collect wastewater samples. EPA held numerous meetings with committees and individuals of trade associations representing segments of the industry and suppliers of dyes and chemicals used by the industry.

Literature information was an important aid in nearly all phases of the technical and economic studies. Over 240 articles, documents, and publications were consulted in developing the technical information and 41 were consulted in developing the economic analysis.

An additional very significant source of data was the findings of the EPA/Industry Pilot Plant Research Project. A grant (No. R-804329) for the project was awarded to the American Textile Manufactures Institute (ATMI), the Northern Textile Association (NTA), and the Carpet and Rug Institute (CRI) on January 26, 1976; the EPA Office of Research and Development and the Effluent Guidelines Division cooperated in directing the work. As part of the study, two mobile pilot plants were constructed, each containing the following treatment technologies: chemical coagulation/clarification; multi-media filtration; activated carbon adsorption; and ozonation. The units visited a total of 19 textile facilities, representing six of the nine major subcategories (Wool Scouring, Wool Finishing, Woven Fabric Finishing, Knit Fabric Finishing, Carpet Finishing, and Stock and Yarn Finishing), from May 1977 to October 1978. The units tested the various pilot scale treatment technologies for effectiveness in removing the BPT regulated pollutants (BOD5, COD, TSS, phenol, total chromium, sulfide, color, oil and grease, and pH) from the biologically treated and clarified wastewaters at these facilities. During the initial month of a visit, the best candidate treatment modes were established; during the subsequent two weeks, the effectiveness of these modes was monitored. Bench scale dissolved air flotation (DAF) and powdered activated carbon treatment (PACT) studies also were performed on the waste from some study sites. Details of the research project and findings will be available from the Office of Research and Development after the final report is completed. Summaries of the findings are available in Section VII of the Development Document.

Samples for determination of toxic pollutants were collected and analyzed at each of the 19 sites during the initial phase of the study. Samples of the flow into and out of the candidate mode technologies were collected and analyzed for toxic pollutants at 10 of 19 sites during the pilot plant visits; the sampling periods ranged from one to ten days. (See Sampling and Analytical Program.)

V. Sampling and Analytical Program

As Congress recognized in enacting the Clean Water Act of 1977, the state-of-the-art ability to monitor and detect toxic pollutants is limited. Most of the toxic pollutants were relatively unkown until only a few years ago, and only on rare occasions has EPA regulated, or has industry monitored or even developed methods to monitor for these pollutants. As a result, analytical methods for many toxic pollutants under Section 304(h) of the Act have not yet been promulgated. Moreover, state-of-the-art techniques involve the use of expensive, sophisticated equipment, with costs ranging as high as $200,000 per unit.

When faced with these problems, EPA scientists, including staff of the Environmental Research Laboratory in Athens, Georgia and staff of the Environmental Monitoring and Support Laboratory in Cincinnati, Ohio, conducted a literature search and initiated a laboratory program to develop analytical and sampling protocols. The result was the establishment of a comprehensive set of procedures entitled, *Sampling and Analysis Procedures for Screening of Industrial Effluents for Priority Pollutants,* (EPA, Cincinnati, Ohio, April 1977).

Because Section 304(h) methods were available for most toxic metals, pesticides, cyanide, and phenol, the analytical effort focused on developing methods for sampling and analyzing organic toxic pollutants. The three basic analytical approaches considered were infrared spectroscopy, gas chromatography (GC) with multiple detectors, and gas chromatography/mass spectrometry (GC/MS). In selecting among these alternatives, EPA considered sensitivity, laboratory availability, costs, applicability to diverse waste streams from numerous industries, and capability for implementation within the statutory and court-ordered time constraints of EPA's program.

The Agency concluded that infrared spectroscopy was not sufficiently sensitive or specific for application in water, and that GC with multiple detectors without mass spectroscopy would require multiple runs incompatible with time constraints and would possibly eliminate detection of certain toxic pollutants. EPA chose GC/MS because it could identify a wide variety of pollutants in many different matrices and do so in the presence of interfering compounds and within the time constraints of the program. In EPA's judgment, GC/MS and the other

analytical methods for toxics used in this rulemaking represent the best state-of-the-art methods for toxic pollutants analyses available at the time of this study.

As the state-of-the-art matures, EPA intends to refine the sampling and analytical protocols to keep pace with technology advancements. However, limited resources prevent EPA from reworking completed sampling and analyses to keep up with the evolution of analytical methods. As a result, the analytical techniques used in some rulemakings may differ slightly from those used in others. In each case, however, the analytical methods used represent the best state-of-the-art available for a given industry study. One of the goals of EPA's analytical program is the promulgation of additional Section 304(h) analytical methods for toxic pollutants, scheduled for calendar year 1979.

The field sampling program in this study differed from the one plant per subcategory screening phase and five plants per subcategory verification phase recommended in the protocol. The number of plants sampled per subcategory was varied to match each subcategory's share of the water pollution problem. Since the textile dyeing and finishing segments of the industry consist of facilities with significant differences in production processes, equipment, raw materials, finishes, dyes, and auxiliary chemicals, the screening sampling phase was expanded and the verification phase reduced. Tkhirty-nine plants were sampled during the screening phase and 22 plants were sampled during the verification phase including 11 plants which had previously been screened. The sampling involved 50 separate plants (39 direct dischargers, 9 indirect dischargers, 1 recycle plant, and 1 plant that practices land application) and a total of 327 samples (28 source water, 64 raw wastewater, 90 biological treatment effluent, 38 physical/chemical treatment effluent, and 107 waste treatment from the EPA/Industry Pilot Plant Research Project) were collected.

The primary objective of the field sampling program was to produce composite samples of wastewater, from which concentrations of toxic pollutants could be ascertained. Presampling plant visits were generally made to assess the value of a particular plant to the sampling program and to make the arrangements necessary for successful, time-efficient sampling. The sampling period varied from eight hours to over ten days, but in most cases the sampling was conducted over a 24-hour period. Raw wastewater samples were taken either before treatment or after minimal preliminary treatment (e.g., screening), depending upon the accessibility of the wastewater stream. Treated effluent samples were taken either following pretreatment (usually indirect dischargers) or after biological and/or physical/chemical treatment (direct dischargers). Pilot plant waste treatment samples were collected into and out of pilot-scale treatment units housed in one of two mobile pilot plants. (See Data Gathering Efforts.) Source water samples were collected from supplies within the processing facilities to determine the presence of toxic pollutants prior to contamination by textile processes.

Samples were collected by grab and composite sampling techniques. Automatic samplers were used to collect raw wastewater and effluent samples for analysis of conventional, nonconventional, nonvolatile organics, and metallic pollutants of pollutant parameters. Grab sampling techniques were used to collect samples for oil and grease and volatile organic acids. Details of the sampling techniques, sample container preparation, sampling logistics, and sample shipping procedures are discussed in appendix D of the Development Document.

The analyses for the 129 toxic pollutants were performed according to groups of chemicals and associated analytical schemes. Organic toxic pollutants include 32 volatile (purgeable) and 82 nonvolatile pollutants. The nonvolatile pollutants include 47 base-neutrals, 11 acid extractables, and 24 pesticides. Inorganic toxic pollutants include 13 heavy metals, cyanide, and asbestos. Two pollutants were not analyzed for: 2,3,7,8-tetrachlorodibenzo-a-dioxin (TCDD) and asbestos. TCDD was omitted because of its extreme toxicity and the health hazards involved in preparing standard solutions and because it was not expected to be present. Asbestos was omitted because of the presence of other fibrous material in textile wastewaters, which made identification extremely difficult. Endrin aldehyde was not analyzed for during the initial screening phase because pure endrin aldehyde could not be obtained in time to prepare the required standard solutions.

The primary analytical method used to identify volatile, base-neutral, and acid organics was gas chromatography (GC) with confirmation and quantification on all samples by mass spectrometry (MS). GC was employed for analysis of pesticides with limited MS confirmation. The Agency analyzed the toxic heavy metals by atomic adsorption spectrophotometry (AAS), with flame or graphite furnace atomization following appropriate digestion of the sample, and by the inductively coupled argon plasma (ICAP) excitation technique. Cyanide and total phenols were measured by conventional wet chemistry techniques as outlined in "Standard Methods for the Examination of Water and Wastewater, 14th Edition." Analyses for conventional pollutants (BOD5, TSS, oil and grease, and pH), and nonconventional pollutants (COD, sulfide, and color) were accomplished using "Methods for Chemical Analysis of Water and Wastes" (EPA 625/6-74-003) and amendments. A detailed discussion of the analytical procedures employed for all determinations is provided in Appendix D of the Development Document.

VI. Industry Subcategorization

In developing these regulations, it was necessary to determine whether different effluent limitations and standards of performance were appropriate for different groups of plants (subcategories) within the industry. The factors considered in identifiying these subcategories included: Raw materials used; products; manufacturing processes employed; size and age of manufacturing facility and equipment; waste characteristics; water pollution control technology; treatment costs; energy requirements; and solid waste generation and disposal requirements. Similarity of financial characteristics was considered in the economic analysis. On the basis of these factors, the industry was divided into nine general subcategories, and two of these were each divided into three subdivisions. (The July 4, 1974, regulations were based on eight subcategories, while the May 26, 1977, regulations were based on seven subcategories.) The major factors and the rationale determining the subcategorization are set out in Section IV of the Development Document. In general, subcategorization is based on raw materials, products, and waste characteristics.

The subcategories and subdivisions of the textile industry are:

1. Wool Scouring—facilities that primarily scour natural impurities from raw wool and other animal hair fibers. Integrated mills that include wool scouring processes should calculate their discharge allowances by applying the applicable wool scouring effluent limitations to the wool scouring production and the other applicable

effluent limitations to the other kinds of production.

2. Wool Finishing—facilities that finish fabric that is primarily animal hair fiber (wool, or other animal hair fiber, or blends containing primarily wool or other animal hair fiber) by using any of the following operations on at least five percent of their total production: Carbonizing, fulling, bleaching, scouring (not including raw grease wool scouring), dyeing and/or application of functional finish chemicals. Facilities that primarily finish stock or yarn that is primarily animal hair fiber are included in this subcategory. Wool stock or yarn mills that do not perform carbonizing and scouring are covered under Stock and Yarn Finishing. Integrated mills that primarily finish wool fabric along with greige goods manufacturing or other finishing operations (such as yarn dyeing) are included in this subcategory and applicable wool finishing effluent limitations should be applied to the total production (excluding weaving and other dry operations, and wool scouring) to calculate discharge allowances.

3. Low Water Use Processing—facilities other than finishing facilities engaged only in manufacturing greige goods, laminating or coating fabrics, texturizing yarn, tufting and backing carpet, producing tire cord fabric, and similar activities in which either cleanup is the primary water use or process water requirements are small, or both.

4. Woven Fabric Finishing—facilities that primarily finish woven fabric, by using any of the following operations on at least five percent of their production: Desizing, scouring, bleaching, mercerizing, dyeing, printing, and/or application of functional finish chemicals. Denim finishing mills are included in this subcategory, but facilities finishing woven fabric composed primarily of wool are covered under Wool Finishing. Integrated mills that primarily finish woven fabric, along with greige goods manufacturing or other finishing operations (such as yarn dyeing), are included in this subcategory and the applicable woven fabric finishing effluent limitations should be applied to the total production (excluding weaving and other dry operations) to calculate discharge allowances.

a. Simple Processing—subdivision of Woven Fabric Finishing for facilities that perform fiber preparation, desizing, scouring, or functional finishing, and/or one of the following processes applied to more than five percent of total production: Bleaching, dyeing, or printing. This subdivision includes all Woven Fabric Finishing facilities that do not qualify under either the Complex Processing or Complex Processing Plus Desizing subdivision.

b. Complex Processing—subdivision of Woven Fabric Finishing for facilities that perform desizing of less than 50 percent of their total production and more than one of the following, each applied to more than five percent of total production: Bleaching, dyeing, or printing. These facilities may also perform fiber preparation, scouring, mercerizing, and functional finishing.

c. Complex Processing Plus Desizing—subdivision of Woven Fabric Finishing for facilities that perform desizing of greater than 50 percent of their total production, and more than one of the following, each applied to more than five percent of total production: Bleaching, dyeing, or printing. These facilities may also perform fiber preparation, scouring, mercerizing, and functional finishing.

5. Knit Fabric Finishing—facilities that primarily finish cotton and/or synthetic fiber fabric, a majority of which is knit, by employing any of the following operations on at leat five percent of their production: Scouring, bleaching, dyeing, printing, and/or application of lubricants, antistatic agents, and functional finish chemicals. Integrated mills that primarily finish knit fabric, along with greige goods manufacturing or other finishing operations such as yarn dyeing, are included in this subcategory and the applicable knit fabric finishing effluent limitations should be applied to total production (excluding knitting and other dry operations) to calculate discharge allowances.

a. Simple Processing—subdivision of Knit Fabric Finishing for facilities that perform fiber preparation, scouring, or functional finishing, and/or one of the following processes applied to more than five percent of total production: Bleaching, dyeing, or printing. This subdivision includes all Knit Fabric Finishing facilities that do not qualify under either the Complex Processing or Hosiery Products subdivision.

b. Complex Processing—subdivision of Knit Fabric Finishing for facilities that perform more than one of the following processes each applied to more than five percent of total production: Bleaching, dyeing, or printing. These facilities may also perform fiber preparation, scouring, mercerizing, and functional finishing.

c. Hosiery Products—subdivision of Knit Fabric Finishing for facilities that are engaged primarily in dyeing or finishing hosiery of any type.

6. Carpet Finishing—facilities that primarily finish carpet and other textile-based floor covering products, by employing any of the following operations on at least five percent of their production: Scouring, bleaching, dyeing, printing, and/or application of functional finish chemicals. Facilities that only perform carpet tufting and/or backing are covered under Low Water Use Processing. Integrated mills that primarily finish carpet along with tufting or backing operations or other finishing operations (such as yarn dyeing) are included in this subcategory and the applicable carpet manufacturing effluent limitations should be applied to total production (excluding tufting, other dry processing, and backing) to calculate discharge allowances.

7. Stock and Yarn Finishing—facilities that primarily finish stock, yarn, or thread of cotton and/or synthetic fiber by employing any of the following oeprations on at least five percent of their production: Scouring, bleaching, mercerizing, dyeing, and/or application of functional finish chemicals. Facilities finishing stock, yarn, or thread principally of wool also are covered if they do not perform carbonizing. Integrated mills that primarily finish stock and yarn along with greige goods manufacturing or other finishing operations are included in this subcategory and the applicable stock and yarn finishing effluent limitations should be applied to total production (excluding knitting, weaving, and other dry operations) to calculate discharge allowances.

8. Nonwoven Manufacturing—facilites 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 Felted Fabric Processing). Integrated mills that primarily manufacture nonwoven textile products along with greige goods manufacturing or other finishing operations are included in this subcategory and the applicable nonwoven manufacturing effluent limitations should be applied to total production (excluding dry web formation knitting, weaving, and other dry operations) to calculate discharge allowances.

9. Felted Fabric Processing—facilities that primarily manufacture nonwoven products by using fulling and felting operations to achieve fiber bonding. Integrated mills that primarily process a felted fabric, along with greige goods manufacturing or other finishing operations, are included in this subcategory and the applicable felted fabric processing effluent limitations should be applied to total production

(excluding knitting, weaving, or other dry operations) to calculate discharge allowances.

The economic structure of the industry was analyzed to determine the types of facilities represented in the above subcategories and internal subdivisions of subcategories. The principal factors considered were product ownership and extent of integration. The types of mills identified were: Commission mills, finishers of owned fabric or yarn, and integrated mills. Commission mills dye and/or finish goods owned by others on a commission basis. Finishers of owned fabric or yarn purchase greige goods for finishing. These finishers differ from the commission finishers because their revenues come from the sales of finished textile goods. Commission finisher revenues consist of commission receipts for job finishing. Integrated mills manufacture greige goods and perform finishing of these goods at the same facility. For a complete discussion on the types of facilities, see Section VI of the Economic Analysis.

VII. Available Wastewater Control and Treatment Technology

A. Status of In-Place Technology. The control measures and treatment technologies that are available for textile industry processing and waste treatment include a broad range of in-plant and process changes and end-of-pipe treatment. The in-plant control measures range from minor water conservation, such as liquid level control, to complete change of process such as continuous versus batch processing and nonaqueous versus aqueous dyeing. The treatment technologies range from no treatment to complete recyle systems, although the latter is certainly the exception rather than the rule. At most plants, programs combining elements of both control and treatment are applicable and individual mills should consider both to determine which specific combination is best suited to their particular situation.

In-plant control measures may be divided into five types as follows: (1) Water reuse; (2) water reduction; (3) chemical substitution; (4) material reclamation; and (5) process changes and new process technology.

The distinction between water reuse and water reduction is not sharply defined, but, in general, water reuse is the use of the same water more than once, while water reduction is the use of less water. These measures are the most common controls in use.

Chemical substitution is practiced to replace process chemicals having high pollutant strength or toxic properties with others that are less polluting or more amenable to treatment.

Material reclamation measures are often implemented, but to reduce processing costs rather than pollutant loadings.

Process changes comprise a group of related measures that are used to achieve benefits in the other four control areas. They result in reductions of hydraulic and/or pollutant loadings to treatment systems while improving the quality and efficiency of the processing.

EPA evaluated all of the in-plant control technologies and process changes noted above in developing the proposed regulations. However, the Agency did not consider any specific one in establishing the effluent limitations for existing or new source dischargers. Basically, there are no specific control measures that are necessary in the industry as a whole or in one or more particular subcategories. However, this does not imply that these measures are unimportant or should be eliminated from further consideration. These measures can effect savings both in manufacturing cost and in the cost of treatment, and in the future will assume a much greater role in treatment and conservation of energy and materials.

The end-of-pipe treatment technology employed by the industry may be classified as follows: No treatment; preliminary treatment (neutralization, screening, equalization, heat exchange, disinfection, primary sedimentation, and/or flotation); biological or equivalent treatement (aerated and unaerated lagoons, biological filtration, activated sludge, and chemical coagulation/sedimentation without preceding biological treatment); and physical/chemical treatment (filtration, chemical coagulation, and/or granular or powdered activated carbon adsorption following biological treatment). Approximately 30 percent of the direct dischargers provide no treatment or only preliminary treatment. Many of these are waiting to connect to POTWs currently in the construction or design stages. Most of the direct dischargers provide biological or equivalent treatment with about two-thirds of these providing activated sludge, primarily the extended-aeration mode. Less than 10 percent of the direct dischargers provide advanced waste treatment; several recycle their treated effluent for in-plant use.

Approximately 60 percent of the indirect dischargers surveyed provide no treatment. Most of these facilities have been able to discharge to POTWs without facing specific controls, but this may change as more municipalities fully evaluate their industrial waste contribution and assess user charges in accordance with EPA guidelines. Over 30 percent provide preliminary treatment similar to that noted above for direct dischargers. Approximately 9 percent provide biological or equivalent treatment (same as noted above for direct dischargers), with about 14 percent of these employing some type of activated sludge to some degree. Many of those employing activated sludge are former direct dischargers that have connected to a POTW. Only one indirect discharger surveyed employs physical/chemical wastewater treatment technology.

B. Control Technologies Considered. The alternative treatment technologies considered for existing direct and indirect discharge sources include various combinations of biological treatment, chemcial coagulation and sedimentation, multi-media filtration, dissolved air flotation, activated carbon adsorption, and chemical oxidation with ozone (ozonation). The specific alternatives evaluated in terms of costs and reduction benefits included: (1) Screening and 24-hour extended-aeration activated sludge with solids recycle; (2) chemical coagulation and sedimentation; (3) multi-media filtration; (4) chemical coagulation, sedimentation, and multi-media filtration; (5) multi-media filtration and granular activated carbon adsorption; (6) ozonation; (7) chemical coagulation, sedimentation, and ozonation; (8) chemical coagulation, sedimentation, multi-media filtration, and ozonation; (9) chemical coagulation and dissolved air flotation (Wool Scouring only); (10) chemical coagulation, dissolved air flotation, multi-media filtration, and granular activated carbon adsorption (Wool Scouring only); and (11) chemical coagulation, dissolved air flotation, and Ozonation (Wool Scouring only). The alternatives apply differently to direct and indirect dischargers and are not universal for all subcategories (see Section VIII of the Development Document).

The alternatives considered for new sources are based on the same treatment technologies noted for existing sources plus segregation of process wastes into toxic and nontoxic waste streams. Although not specifically practiced in the industry, segregation of wastes is considered feasible and appears to be especially cost-effective for larger flows. The specific alternatives evaluated included: (1) Screening, 24-hour extended-aeration activated sludge with solids recycle; (2) screening, 24-hour extended-aeration activated sludge with solids recycle,

chemical coagulation, sedimentation, and multi-media filtration; (3) screening, equalization, multi-media filtration, and granular activated carbon adsorption of toxic stream and screening and 8-hour activated sludge with solids recycle of nontoxic stream (flows above 0.25 mgd); and screening, 24-hour extended-aeration activated sludge with solids recycle, multi-media filtration, and granular activated carbon adsorption of total waste flow (flows at or below 0.25 mgd); and (4) screening, equalization, chemical coagulation, sedimentation, multi-media filtration, and granular activated carbon adsorption of toxic stream and screening and 8-hour activated sludge with solids recycle of nontoxic stream (flows above 0.25 mgd); and screening, 24-hour extended-aeration activated sludge with solids recycle, chemical coagulation, sedimentation, multi-media filtration, and granular activated carbon adsorption of total waste flow (flows at or below 0.25 mgd). For Wool Scouring, chemical coagulation and dissolved air flotation replace multi-media filtration. The alternatives apply differently to direct and indirect dischargers since biological treatment is not used by indirect dischargers. For those waste streams that do not contain measurable amounts of the 129 toxic pollutants, screening alone is required before discharging to a POTW collection system.

None of the treatment technologies underlying the proposed regulations are considered to be innovative and, although not common, all are presently employed in the industry.

VIII. Best Available Technology Effluent Limitations

The factors considered in establishing the best available technology economically achievable (BAT) level of control include environmental considerations such as air pollution, solid waste generation, and energy consumption; the costs of applying the control; the process used; the age of process equipment and facilities; the engineering aspects of applying various types of control techniques; and process changes (Section 304(b)(2)(B)). In general, the BAT technology level represents, at a minimum, the best existing economically achievable performance of plants of shared characteristics. Where existing performance is uniformly inadequate, BAT technology may be transferred from a different subcategory or industrial category. BAT may include process changes or internal controls, even when not common industry practice.

The statutory assessment of BAT considers costs, but does not require a balancing of costs against effluent reduction benefits (see *Weyerhauser* v. *Costle*, 11 ERC 2149 (D.C. Cir. 1978)). However, in assessing the proposed BAT, the Agency has given substantial weight to the reasonableness of costs. The Agency has considered the volume and nature of discharges, the volume and nature of discharges expected after application of BAT, the general environmental effects of the pollutants, and the costs and economic impacts of the required pollution control levels.

The effluent limitations were developed for the control technology options in a building block fashion, by engineering analysis using the proper application and operation of the extended-aeration activated sludge treatment technology (BPT) as a base (BAT Option 1). The performance of additional end-of-pipe control technologies was established by engineering analysis of the application of these technologies and their performance in other related applications, including full-scale and pilot-scale units. The effluent resulting from Option 1 was subjected to the performance of suspended solids control in the form of multi-media filtration, which has been demonstrated in pilot plant studies and at full scale on the wastewater from most of the textile industry subcategories. The resulting effluent quality was the basis for BAT Option 2. The effluent resulting from Option 1 was also subjected to the performance of physical/chemical treatment in the form of coagulation/sedimentation, which has been demonstrated in pilot plant studies and at full scale on the wastewater from most of the textile industry subcategories. The resulting effluent quality was the basis for BAT Option 3. Finally, the resulting effluent from Option 3 was subjected to the performance of suspended solids control in the form of multi-media filtration, with the resulting final effluent quality serving as the basis for BAT Option 4.

All of the reductions projected by this engineering analysis for total suspended solids as an "indicator" pollutant (see REGULATED POLLUTANTS) are based on long-term performance, resulting in final effluent qualities that are considered to be long-term averages. Estimates of effluent quality variability were made to establish maximum 30-day average and maximum day mass effluent limitations (lb/1,000 lb of finished product).

Despite expanded consideration of costs, the primary determinant of BAT is effluent reduction capability using economically achievable technology. Moreover, as a result of the Clean Water Act of 1977, the achievement of BAT has become the national means of controlling the discharge of toxic pollutants. The textile industry discharges 29 of the 129 toxic pollutants and EPA has selected, among four available control options, BAT technology that will significantly reduce their discharge. Explanation and analysis of these options follows. For more detailed discussion, see Section IX of the Development Document.

(A) Option 1—Allow a discharge based on the proper application and operation of biological treatment technology for textile wastewaters discharged to navigable waters. This option does not require in-plant controls or additional end-of-pipe treatment technology beyond BPT. The technology required by this option (BPT) is well demonstrated in the industry and would not result in additional effects on non-water environmental quality. The effluent concentrations of the 29 most significant toxic pollutants would be at or below 0.7 mg/l and the estimated total toxic pollutant contribution from the direct dischargers of 600 tons/year would be reduced approximately 50 percent (80 percent for the 17 significant organics and 35 percent for the 11 significant metallics). The COD, TSS, and oil and grease would be reduced by approximately 70, 35, and 75 percent, respectively. Nevertheless, the discharge of all pollutants (i.e., conventional, nonconventional, and toxic) would continue, with high levels of COD and color discharged at most plants. There would be no removal of cyanides. At nearly half the plants so tested with BPT technology in place, these effluents exhibited some degree of toxicity to freshwater minnows, daphnia, and/or algae.

Economic analysis indicates that this option may affect the 35 hosiery, nonwoven, and felt direct dischargers, in addition to the remaining 204 direct dischargers which are regulated under BPT limitations. Compliance with this option would require an estimated 9 of the 239 affected direct dischargers to invest a total of $1.9 million and incur annualized costs (including operation, maintenance, interest, and depreciation) of $876 thousand. These costs may reduce the return on sales of the three impacted subcategories from a current range of 0.8 to 3.6 percent with current BPT limitations to a range of -0.3 to 2.8 percent with this option. The Agency projects that selection of this option may result in 3 plant closings and a loss of

0.1 percent of industry employment for the 1,165 wet processing plants.

(B) Option 2—Allow a discharge based on application of BAT Option 1 plus suspended solids control by multi-media filtration. For Wool Scouring, BAT Option 2 is equal to Option 1. Option 2 incorporates the end-of-pipe addition of multi-media filtration to remove toxic pollutants contained in suspended solids.

The technology behind this option has been well demonstrated in this industry at full scale and in pilot-scale studies. Currently, at least 13 plants use some form of filtration; ten are direct dischargers and three are plants that recycle their discharge. On over half (10 of 19) of the textile plant effluents tested at pilot scale, multi-media filtration was recognized to be one of the best candidate technologies for removing classical pollutants (e.g., BOD5, COD, TSS). Treatability data from three full-scale applications and six pilot scale investigations (a total of 47 samples) indicate estimated average effluent concentrations below 0.3 mg/l for all the 29 significant toxic pollutants except zinc. The zinc effluent level would be below 0.6 mg/1. The total toxic pollutant contribution from the direct dischargers would be reduced approximately 20 percent over Option 1 (40 percent for the 17 significant organics and 10 percent for the 11 significant metallics), achieving an overall toxic pollutant reduction of cover 60 percent of the raw waste load. The COD, TSS, and oil and grease would be reduced, overall, by approximately 75, 80, and 95 percent, respectively.

Multi-media filtration can be readily added to BPT systems to improve overall system performance and dampen "peak" discharges of TSS during BPT upsets. In addition, some added protection is offered over Option 1 against intermittent discharges of high levels of toxic pollutants. However, Option 2 providers little additional reduction of metallic toxic pollutants, COD, and color over Option 1. Energy requirements will increase by an estimated 0.02 to 0.03 percent per plant for the direct dischargers, and sludge generation will increase by an estimated 150 tons/year/plant (33,000 tons/year for all existing direct dischargers).

Economic analysis indicates that compliance with this option may require an estimated 210 of the 239 affected direct dischargers to invest a total of $41 million and incur annualized costs (including operation, maintenance, interest, and depreciation) of $18 million. These costs may reduce the return on sales of the impacted subcategories from a current range of 0.8 to 5.9 percent with BPT to a range of −0.5 to 5.0 percent with this option. The Agency projects that selection of this option may result in 11 plant closings and a loss of 0.4 percent of industry employment for the 1,165 wet processing plants.

(C) Option 3—Allow a discharge based on application of BAT Option 1 plus chemical treatment in the form of chemical coagulation/sedimentation. For Wool Scouring, Option 3 is equal to Option 1. Option 3 incorporates the end-of-pipe addition of chemical coagulation to control organic and metallic toxic pollutants.

The technology behind this option has been demonstrated in this industry at pilot and full scale for control of conventional pollutant parameters and specific colloidal components such as latex (Carpet Mills Subcategory) and print pastes (Woven Fabric Finishing Subcategory) but not specifically for control of toxic pollutants. Currently at least eight direct discharge plants use some form of coagulation; two chemically treat raw wastes. At 6 of 13 textile plants for which the secondary effluent was tested at pilot scale, chemical coagulation was recognized as one of the best candidate technologies for removing classical pollutants (e.g., BOD5, COD, and TSS). Treatability data from the pilot investigations (a total of 12 samples) indicate estimated average effluent concentrations of the 29 significant toxic pollutants, except 1,2,4-trichlorobenzene and zinc, at or below 0.1 mg/l. The 1,2,4-trichlorobenzene and zinc effluent levels would be at or below 0.4 and 0.2 mg/l, respectively. The total toxic pollutant contribution from the direct dischargers would be reduced approximately 50 percent over Option 1 (30 percent for the 17 significant organics and 50 percent for the 11 significant metallics), and 35 percent over Option 2 (no removal of the 17 significant organics and 40 percent for the 11 significant metallics), effecting an overall toxic pollutant reduction of over 75 percent of the raw waste load. The COD, TSS, and oil and grease would be reduced, overall, by approximately 80, 60, and 90 percent, respectively; some additional color removal over Option 2 will be recognized.

Coagulation can be readily added to BPT systems to improve overall system performance and dampen "peak" discharges of TSS during BPT upsets. Compared to Option 2, Option 3 would significantly improve the removal of metallic toxic pollutants. However, Option 3 offers no additional removal of organic toxic pollutants or COD and less removal of TSS. The technology has not been demonstrated in all subcategories of the industry and pilot plant data have indicated that coagulation is often ineffective for Woven Fabric Finishing wastewaters. Energy requirements will increase by an estimated 0.2 to 0.5 percent per plant, and sludge generation will increase by an estimated 300 tons/year/plant (65,000 tons/year for all existing direct dischargers).

Economic analysis indicates that compliance with this option may require an estimated 210 of the 239 affected direct dischargers to invest a total of $55 million and incur annualized costs of $33 million. These costs may reduce return on sales for the impacted subcategories from a current range of 0.8 to 5.9 percent with BPT to a range of −3.0 to 4.6 percent with this option. The Agency projects that selection of this option may result in 24 plant closings and a loss of 1.0 percent of industry employment for the 1,165 wet processing plants.

(D) Option 4—Allow a discharge based on application of BAT Option 3 plus BAT Option 2 for all subcategories except Wool Scouring. This control option incorporates the end-of-pipe addition of chemical coagulation to control organic and metallic toxic pollutants, and multi-media filtration to control toxic pollutants associated with suspendend solids. For the Wool Scouring Subcategory, this option includes chemical coagulation and dissolved air flotation.

The technology behind this option has been demonstrated at pilot and full scale for the control of conventional pollutant parameters but not specifically for control of toxic pollutants. At 6 to 13 plants for which the secondary effluent was tested at pilot scale, this control level was recognized as one of the best candidate technologies for removing classical pollutants (e.g., BOD5, COD, and TSS). Treatability data from the pilot investigations (a total of 20 samples) indicate estimated average effluent concentrations of all 29 significant toxic pollutants except 1,2,4-trichlorobenzene, antimony, and zinc, at or below 0.08 mg/l. The 1,2,4-trichlorobenzene, antimony, and zinc effluent levels would be at or below 0.2, 0.1, and 0.2 mg/l, respectively. The total toxic pollutant contribution from the direct dischargers would be reduced approximately 55 percent over Option 1, 45 percent over Option 2, and less than 10 percent over Option 3, causing an overall toxic pollutant reduction of approximately 80 percent (90 percent for the 17 significant organics and 65 percent for the 11 significant metallics) of the raw waste load. The COD, TSS, and oil and grease would be reduced,

overall, by approximately 84 and 95 percent, respectively.

This option is compatible with existing BPT and would provide reasonably good protection against intermittent discharges of high levels of organic or metallic toxic pollutants. Overall, however, this option provides little advantage over Option 3 in terms of total toxic pollutants removal. Energy requirements will increase by an estimated 0.2 to 0.5 percent per plant (no significant increase over Option 3), and sludge generation will increase by an estimated 370 tons/year/plant (80,000 tons/year for all existing direct dischargers).

Economic analysis indicates that compliance with this option may require an estimated 217 of the 239 direct dischargers to invest a total of $92 million and incur annualized costs of $44 million. These costs may reduce the return on sales for the impacted subcategories from a current range of −0.9 to 5.9 percent with BPT to a range of −3.8 to 4.2 percent with this option. The Agency projects that selection of this option may result in 29 plant closings and a loss of 1.2 percent of industry employment.

(E) BAT Selection and Decision Criteria—Based on analyses of these control options, the Agency has selected Option 2 for Woven Fabric Finishing (all subdivisions), Knit Fabric Finishing (except the Hosiery Products subdivision), Carpet Finishing, Stock and Yarn Finishing; and Nonwoven Manufacturing and Option 4 for Wool Scouring, Wool Finishing, and the Hosiery Products subdivision of Knit Fabric Finishing as the basis for proposal of BAT effluent limitations. The Agency has based BAT for Felted Fabric Processing on the proper application of biological treatment in the form of extended-aeration activated sludge (Option 1). No BAT regulations are proposed for the Low Water Use Processing subcategory (See Pollutants and Subcategories Not Regulated).

Option 2 is selected because it controls the discharge of high concentrations of TSS and provides substantial reductions of toxic pollutants of concern in this industry. The costs for this control level are reasonable, and the overall economic and non-water quality impacts are within acceptable limits. The Agency rejects Option 3 because treatability data indicate that chemical coagulation is not always effective following biological treatment, especially for Woven Fabric Finishing (all subdivisions). The added benefit of chemical coagulation over filtration for the other subcategories is not significant enough to justify the additional economic and non-water environmental impacts. The Agency also rejects Option 4 (except as noted below) because of economic and non-water environmental impacts which are not justified by the additional pollutant removal.

Option 4 is selected for Wool Scouring, Wool Finishing, and the Hosiery Products subdivision of Knit Fabric Finishing because the TSS concentrations in these subcategories remain high after BPT and are not compatible with multi-media filtration directly. The added application of chemical coagulation will control the discharge of TSS and provide substantial reduction of toxic pollutants of concern in these subcategories also.

Option 1 is selected for Felted Fabric Processing based on the Agency's determination that more advanced treatment is not economically achievable.

The Agency developed the effluent limitations in a building block fashion by engineering analysis using full-scale and pilot-scale treatability data. First, median BPT effluent concentration levels were established for the conventional and nonconventional pollutants for each subcategory. Long-term data were available from NPDES permit monitoring reports and the industry survey questionnaires. (See Section V of the Development Document.) Second, separate statistical analyses were carried out for COD, TSS, color, and total phenol at selected, well-operated textile waste treatment facilities to determine the normal and seasonal variability of the data. The median BPT effluent concentration values were adjusted by the median maximum month/average month value for each pollutant. The concentrations were converted to mass loadings (kg/kkg of finished product) by applying the median water usage values for each subcategory (as established from the data noted above) to provide the basis for the 30-day average limitations. The basis for the maximum daily limitations was application of specific factors to the 30-day average limitations. These factors are determined by dividing the median maximum day/average month values by the median maximum month/average month values.

Finally, effluent limitations based on the BAT option selected were calculated for both the 30-day average and maximum day by application of established treatment performance factors. The values established, and the variability and treatment performance factors employed, are discussed in Section IX of the Development Document.

IX. Best Conventional Pollutant Control Technology Effluent Limitations

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)—BOD, TSS, fecal coliform and pH—and any additional pollutants defined by the Administrator as "conventional" (oil and grease).

BCT is not an additional limitation, but replaces BAT for the control of conventional pollutants. BCT requires that limitations for conventional pollutants be assessed in light of a new "cost-reasonableness" test, which involves a comparison of the cost and level of reduction of conventional pollutants from the discharge of POTWs to the cost and level of reduction of such pollutants from a class or category of industrial sources. As part of its review of BAT for certain "secondary" industries, the Agency promulgated methodology for this cost test. (See 44 FR 50732 (August 29, 1979)). This methodology compares subcategory removal costs (dollars per pound of pollutant, measuring from BPT to BAT) with costs experienced by POTWs.

EPA applied this methodology to the costs for removal of conventional pollutants in the textile industry and concluded that BCT limitations based upon multi-media filtration (BAT Option 2) are reasonable for larger plants in the Woven Fabric Finishing, Knit Fabric Finishing (except Hosiery Products), Carpet Finishing, Stock and Yarn Finishing, and Nonwoven Manufacturing subcategories. For larger plants in the Wool Scouring, Wool Finishing, and Hosiery Products Subdivision of Knit Fabric Finishing subcategories, BCT limitations based on chemical coagulation plus multi-media filtration (dissolved air flotation for Wool Scouring) (BAT Option 4) were found to be reasonable. Using a POTW cost of $1.17 per pound of BOD5 and TSS removed, production sizes equal to or greater than those noted in the following tabulation pass the BCT "cost-reasonableness" test. Smaller sizes do not pass the test. The method used in calculating BCT costs for the textile industry is fully discussed in Section X of the Development Document.

Subcategory	Production Size, kkg/yr
Wool Scouring	3,300
Wool Finishing	5,800
Woven Fabric Finishing	
Simple Processing	13,500
Complex Processing	12,200

Subcategory	Production Size, kkg/yr
Complex Processing Plus Desizing	9,300
Knit Fabric Finishing:	
Simple Processing	7,200
Complex Processing	11,700
Hosiery Products	14,100
Carpet Finishing	9,500
Stock and Yarn Finishing	16,400
Nonwoven Manufacturing	28,300

The Agency is therefore proposing BCT effluent limitations at the BAT Option 2 and BAT Option 4 technologies for plants with production equal to or greater than these values and at the existing BPT limitations for plants with production less than these values. BCT limitations for plants less than the above values in the Nonwoven Manufacturing Subcategory and all plants in the Felted Fabric Processing Subcategory, are based on BAT Option 1, and BCT effluent limitations for plants in the Low Water Use Processing Subcategory are based on existing BPT limitations for all production sizes.

X. New Source Performance Standards

The basis for new source performance standards (NSPS) under Section 306 of the Act is the best available demonstrated technology. New plants have the opportunity to design the best and most efficient textile processing and wastewater treatment facilities, so Congress directed EPA to consider the best demonstrated process changes, in-plant controls, and end-of-pipe treatment technologies that reduce pollution to the maximum extent feasible. New sources are encouraged to reduce the use and/or discharge of both water and toxic pollutants by application of in-plant control measures, but it is expected that many of the toxic pollutants present in the discharges from the industry today will also be present in the discharges from new sources. To control these and the conventional pollutants, the Agency has selected NSPS from three options. Explanation and discussion of these options follows. For more detailed discussion, see Section XI of the Development Document.

(A) Option 1—Require performance standards based on the same technology proposed for BAT Option 1, which is biological treatment.

This option also encourages full application of appropriate in-plant control measures and pretreatment, which will maximize the performance of the extended-aeration activated sludge treatment technology. As a result, the most significant toxic pollutants would be reduced by approximately 50 percent.

This technology is well demonstrated and would not change the rate of entry of new plants into the industry or slow the rate of industry growth. (See Option 1, BAT Effluent Limitations.)

(B) Option 2—Require performance standards based on NSPS Option 1 plus chemical coagulation and multi-media filtration (dissolved air flotation for Wool Scouring). This option is equivalent to BAT Option 4 and is fully discussed in that section. The technology, based on a typical plant with an 0.82 mgd wastewater discharge, will generate approximately 1,400 tons of sludge (including biological) per year per new source and energy requirement would be 0.8 to 1.4 percent of facility total.

Economic analysis indicates that this option may reduce the rate of entry into the Felted Fabric Processing Subcategory and, consequently, slow the rate of industry growth. Return on sales for these mills may be reduced from a projected range of 3.3 to 7.4 percent with current NSPS to a range of 1.8 to 6.7 percent with this option. EPA does not anticipate that this option will seriously affect production, employment, local communities, or balance of trade for the other subcategories in the industry.

(C) Option 3—Require performance standards based upon treatment of segregated toxic waste streams and other process-related and nonprocess-related waste streams. The segregated toxic streams are treated in a train comprising screening, equalization, chemical coagulation/sedimentation, multi-media filtration, and granular activated carbon adsorption. For Wool Scouring, multi-media filtration is replaced by dissolved air flotation. The remaining waste streams are treated by conventional 8-hour activated sludge with prior screening and return of biomass from a secondary clarifier. For total mill flows of 0.25 mgd and less, the toxic waste streams are not segregated, and the total flow is treated by 24-hour extended-aeration activated sludge followed by chemical coagulation, sedimentation, multi-media filtration or dissolved air flotation, and carbon adsorption.

The technology behind this option has been demonstrated in this industry at pilot scale for control of conventional and nonconventional pollutant parameters but not specifically for control of toxic pollutants. Currently, only three textile facilities are known to have technology of this nature in place; one is a direct discharger and two recycle their treated effluent back to the processing facilities. The total toxic pollutant contribution from each new source would be reduced approximately 25 percent over Option 1 (33 percent for the 17 significant organics and 25 percent for the 11 significant metallics). No additional reduction would be recognized over Option 2, effecting an overall reduction of toxic pollutants of 60 percent of the raw waste load.

This technology has not been significantly demonstrated in the textile industry, and the segregation of wastes may not be feasible for all subcategories or processes within the subcategories. Based on a typical plant with an 0.82 mgd wastewater discharge, approximately 790 tons of sludge per year per new source will be generated, and energy requirements will be 1.3 to 2.0 percent of facility total.

Economic analysis indicates that this option may reduce the rate of entry into the Felted Fabric Processing Subcategory and, consequently, slow the rate of industry growth. Return on sales for these mills may be reduced from a projected range of 3.3 to 7.4 percent with current NSPS to a range of 1.4 to 6.5 percent with this option. EPA does not anticipate that this option will seriously affect production, employment, local communities, or balance of trade for the other subcategories in the industry.

(D) NSPS Selection and Decision Criteria—EPA has selected Option 2 as the basis for proposed NSPS for all subcategories except Low Water Use Processing because it provides a significant reduction in toxic pollutants of concern with technology that has been demonstrated at full scale on the waste from this industry. The Agency rejects Option 1 because it is not entirely consistent with the basis for NSPS except for Low Water Use Processing, which has only small amounts of toxic pollutants present. It does not represent the best available demonstrated technology and does not reduce pollution to the maximum extent feasible. The Agency rejects Option 3 because the overall feasibility of activated carbon for the removal of specific toxic pollutants has not been sufficiently demonstrated in this industry or in other industries where it may be transferable to this industry. The benefits of segregation of the toxic waste stream for direct dischargers are dependent on the size of the facility (flow rate); however, the Agency does feel that segregation would be a worthwhile, cost-effective consideration for anyone trying to comply with the proposed NSPS effluent limitations.

XI. Pretreatment Standards for Existing Sources

Section 307(b) of the Act requires EPA to promulgate pretreatment standards for existing sources (PSES), which must be achieved within three years of promulgation. PSES are designed to

prevent the discharge of pollutants that pass through, interfere with, or are otherwise incompatible with the operation of POTWs. The Clean Water Act of 1977 adds a new dimension by requiring pretreatment for pollutants, such as heavy metals, that limit POTW sludge management alternatives, including the beneficial use of sludges on agricultural lands. The legislative history of the 1977 Act indicates that pretreatment standards are to be technology-based, analogous to the best available technology for removal of toxic pollutants. The general pretreatment regulations (40 CFR Part 403), which served as the framework for these proposed pretreatment regulations for the textile industry, can be found at 43 FR 27736 (June 26, 1978). Based on these requirements, EPA considered three options for selection of PSES. For detailed discussion of the options available, see Section XII of the Development Document.

(A) Option 1—Require pretreatment standards based on screening, equalization, and/or neutralization as necessary for compliance with prohibitive waste provisions. This option is considered the current level of pretreatment in the industry and would not result in added costs or added economic impact. However, many POTWs will continue to receive significant concentrations of COD, cyanides, and organic and/or metallic toxic pollutants, some of which may regularly or intermittently pass through, interfere with the operation, or contaminate sludges. Total concentration of the 29 observed toxic pollutants would be approximately 5 mg/l, and it is estimated that a total of 1,120 tons of toxic pollutants (38 percent significant organics, 58 percent significant metallics, and 4 percent others) would be discharged per year to POTWs by selecting this option.

(B) Option 2—Require pretreatment standards based on PSES Option 1 plus chemical treatment in the form of chemical coagulation/sedimentation. This option includes the preliminary measures of Option 1 plus the end-of-pipe addition of chemical coagulation to control organic and metallic toxic pollutants. For Wool Scouring, chemical coagulation is followed by dissolved air flotation.

The chemical coagulation technology has been discussed under BAT Option 3 and the discussion on treatability there is applicable here. Based on that information, it is estimated that the average effluent concentrations of all 29 significant toxic pollutants would be at or below 0.3 mg/l. The total toxic pollutant contribution from the indirect dischargers would be reduced approximately 50 percent over Option 1 (36 percent for the 17 significant organics and 55 percent for the 11 significant metallics). This amounts to a reduction of 560 tons per year of toxic pollutants, which is approximately 32 percent of the toxic pollutants being discharged by both direct and indirect dischargers under present regulations. The technology has been demonstrated on biologically treated textile wastewaters (see BAT Option 3) and will provide protection against the discharge of high levels of COD and color to POTWs. In addition, it will protect POTW sludges from toxic pollutant contamination. Energy requirements will increase by an estimated 0.2 to 0.5 percent per plant, and an estimated 400 tons/year/plant of industrial sludge (approximately 43,000 tons/year for all affected indirect dischargers) will be generated.

Economic analysis indicates that compliance with this option would require an estimated 107 of the 926 affected indirect dischargers to invest a total of $38 million and to incur annualized costs of $19 million. these costs may reduce the return on sales of the affected mills from a current range of −1.6 to 4.1 percent with current PSES to a range of −11.8 to 3.7 percent with this option. The Agency projects that selection of this option may result in 20 plant closings and a loss of 0.7 percent of industry employment for the 1,165 wet processing plants.

(C) Option 3—Require pretreatment standards based on PSES Option 2 plus suspended solids control by multi-media filtration. This option includes the preliminary measures of Option 1, the chemical treatment of Option 2, plus the end-of-pipe addition of multi-media filtration to control organic and metallic toxic pollutants. For Wool Scouring, Option 3 is equal to Option 2.

The combination of chemical coagulation/sedimentation and multi-media filtration technology has been discussed under BAT Option 4; the treatability data discussed there are applicable here and were used to estimate pollutant removals. Based on these data, it is estimated that the average effluent concentrations of the 29 significant toxic pollutants would be at or below 0.2 mg/l. The total toxic pollutant contribution from the indirect dischargers would be reduced approximately 60 percent over Option 1 (64 percent for the 17 significant organics and 55 percent for the 11 significant metallics) and 21 percent over Option 2 (44 percent for the 17 organics and no removal of the 11 significant metallics), causing an overall toxic pollutant reduction of over 60 percent of the raw waste load. This amounts to a total reduction of 680 tons per year of toxic pollutants, which is approximately 40 percent of the toxic pollutants being discharged by both direct and indirect dischargers under present regulations. This technology further increases protection against the discharge of high levels of COD and color and reduces the possibility of contamination of POTW sludges. Energy requirements will be approximately the same as Option 2, but an estimated 48 additional tons/year/plant of industrial sludge (approximately 48,000 tons/year for all affected indirect dischargers) will be generated.

Economic analysis indicates that compliance with this option would require an estimated 107 of the 926 affected indirect dischargers to invest a total of $55 million and incur annualized costs of $24 million. These costs may reduce the return on sales of the affected mills from a current range of −1.6 to 4.1 percent with current PSES to a range of −12.6 to 3.7 percent with this option. The Agency projects that selection of this option may result in the closing of 20 plants and a loss of 0.7 percent of industry employment at 1,165 wet processing plants.

(D) PSES Selection and Decision Criteria—Based on analysis of these control options, the Agency has selected Option 2 as the basis for proposal of PSES for all subcategories except Low Water Use Processing. This option is selected because it ensures the removal of approximately 36 percent of the organic and 55 percent of the metallic toxic pollutants and allows POTWs more flexibility in sludge disposal. It further protects against the discharge of high levels of COD and color that often pass through POTWs unaffected. Total toxic pollutant removal is analogous to that provided the wastewaters from direct dischargers by employing the recommended BAT. Option 1 is rejected because it provides no control of toxic pollutants or protection against the contamination of POTW sludge. It is selected for Low Water Use Processing because of the small amounts of toxic pollutants present. Option 3 is rejected because the addition of multi-media filtration provides no additional reduction of metallic toxic pollutants, which are the pollutants of most significance for textile industry indirect dischargers.

XII. Pretreatment Standards for New Sources

Section 307(c) of the Act requires EPA to promulgate pretreatment standards for new sources (PSNS) at the same time that it promulgates NSPS. New indirect dischargers, like new direct dischargers, have the opportunity to incorporate the best available demonstrated technologies including process changes, in-plant control measures, and end-of-pipe treatment, and to use plant site selection to ensure adequate treatment system installation. The Agency considered three options for selection of PSNS. For a detailed discussion of the options available, see Section XIII of the Development Document.

(A) Option 1—Require pretreatment standards based on PSES Option 1 (screening, equalization, and/or neutralization as necessary for compliance with prohibitive waste provisions), which is fully discussed in that section. Based on a typical plant with a wastewater discharge of 0.38 mgd, it is estimated that 6.6 pounds/day of toxic pollutants (2.5 pounds/day of the 17 significant organics and 3.8 pounds/day of the 11 significant metallics) will be discharged to POTWs for each new source if this option is selected.

No additional cost or economic impact will result from selection of this option.

(B) Option 2—Require pretreatment standards based on treatment of segregated toxic waste streams and other process-related and nonprocess-related waste streams. The segregated toxic streams are treated in a train comprising PSES Option 3 (screening, equalization, and/or neutralization as necessary for compliance with prohibitive waste provisions plus chemical coagulation/sedimentation and multi-media filtration or dissolved air flotation), while the other waste streams are controlled according to Option 1 (screening, equalization, and/or neutralization). The average effluent concentrations of the 29 observed toxic pollutants would be at or below 0.2 mg/l, and the total toxic pollutant contribution from each new source would be reduced approximately 60 percent over Option 1 (60 percent for the 17 significant organics and 50 percent for the 11 significant metallics).

The technology behind this option has been demonstrated on biologically treated wastewaters in the textile industry, but not specifically on raw wastewaters. Each plant must identify its toxic waste streams for segregation since the generation of toxic pollutants by any one process may vary. Use of PSES Option 3 treatment on the higher concentrations of toxic pollutants associated with a segregated waste stream will improve the effectiveness of the technology as compared with combined wastes. Energy requirements would be 0.2 to 0.5 percent of facility total and approximately 430 tons of sludge per year per new source would be generated.

Economic analysis indicates that this option may slightly slow the rate of entry into the Stock and Yarn Finishing Subcategory, but not significantly slow the rate of industry growth. Return on sales for these plants may be reduced from a projected range of 2.7 to 8.5 percent with current PSNS to a range of 1.9 to 7.1 percent with this option. EPA does not anticipate that this option will seriously affect production, employment, local communities, or balance of trade for the other subcategories in the industry.

(C) Option 3—Require performance standards based on Option 2 plus the addition of activated carbon adsorption to the treatment train applied to the toxic stream.

The combination chemical coagulation/sedimentation, multi-media filtration (dissolved air flotation for Wool Scouring), and activated carbon adsorption technology has been demonstrated at pilot scale for treatment of bilogically treated textile wastewater but has not been demonstrated on raw wastewaters (see NSPS Option 3). No full scale treatability data are available that demonstrate the effectiveness of activated carbon for the control of specific toxic pollutants. Based on the biologically treated effluent treatability data, it is estimated that the total toxic pollutant contribution from each new indirect discharge source would be reduced approximately 14 percent over Option 2 (40 percent for the 17 significant organics and none for the 11 significant metallics) and 62 percent over Option 1 (76 percent for the 17 significant organics and 50 percent for the 11 significant metallics) if this option is selected. In addition, the technology further increases protection against the discharge of high levels of COD and color and reduces potential contamination of POTW sludges.

This technology offers little additional control of toxic pollutants, especially the 11 significant metallics. Sludge generation would be essentially the same as Option 2, but energy requirements would increase to 0.8 to 1.6 percent of facility usage.

Economic analysis indicates that this option may significantly reduce the rate of entry into the Stock and Yarn Finishing Subcategory and, consequently, slow the rate of industry growth. Return on sales for these plants may be reduced from a projected range of 2.7 to 8.5 percent with current PSNS to a range of 1.2 to 6.8 percent with this option. EPA does not anticipate that this option will seriously affect production, employment, local communities, or balance of trade for the other subcategories in the industry.

(D) PSNS Selection and Decision Criteria—Based on analysis of these control options, the Agency has selected Option 2 as the basis for PSNS for all subcategories except Low Water Use Processing. The option was selected because it ensures the removal of approximately 60 percent of the significant organics and 50 percent of the significant metallic toxic pollutants and allows POTWs more flexibility in sludge disposal. It further protects against the discharge of high levels of COD and color that often pass through POTWs unaffected. Option 1 is rejected because it provides no control of toxic pollutants or protection against the contamination of POTW sludge. Option 3 is rejected because the addition of activated carbon adsorption only adds 14 percent to the total reduction of toxic pollutants over Option 2 and provides no additional reduction of metallic toxic pollutants. For Low Water Use, Option 1 is selected because of the small amount of toxic pollutants present.

XIII. Regulated Pollutants

The basis on which the controlled pollutants were selected is set out in Section VI of the Development Document. Summary information is provided about their general nature, common industrial use, use in the textile industry, and detection frequency and concentration levels. Some of these pollutants are designated toxic under Section 307(a) of the Act, and no evidence has been found to warrant removal of any pollutant from the toxics list.

(A) BCT—The pollutants controlled by this regulation include the statutory conventional pollutants, BOD_5, TSS, and pH.

(B) BAT and NSPS—

(1) Nonconventional pollutants—Color, as measured by the ADMI procedure, and COD are the only nonconventional pollutants limited by BAT and NSPS.

(2) Toxic pollutants—The toxic pollutants expressly controlled for direct dischargers in each subcategory are "total phenol," as measured by the 4AAP method, and the following metals: Total chromium, total copper, and total zinc. These pollutants are subject to numerical limitations expressed in

kilograms per thousand kilograms of product (lbs/1000 lbs).

(3) Indicator pollutants—The difficulties of analyses for other toxic pollutants have prompted EPA to propose a new method of regulating certain toxic pollutants. Because historical data are limited and inexpensive analytical methods are not well developed for toxic pollutants, EPA is proposing numerical limitations on an "indicator" pollutant, TSS. The data available to EPA generally show that when this "indicator" pollutant is controlled, the concentrations of toxic pollutants are significantly lower than when TSS is present in high concentrations. While the relationships between TSS and toxic pollutants are not quantifiable on a one-to-one basis, control of an "indicator" will reasonably assure control of toxics with properties responsive to similar treatment mechanisms.

EPA's consideration of "indicator" limitations was brought to the attention of Congress during the formative stages of the Clean Water Act of 1977. At that time, EPA was examining several techniques to alleviate the difficulties of lengthy and expensive analytical procedures. The proposed alternative "indicator" limitations serve that purpose. This method of toxics regulation obviates the difficulties, high costs, and delays of monitoring and analyses that would result from limitations solely on the toxic pollutants.

Appendix B is a list of toxic pollutants that were found in treated effluents at concentrations above the nominal analytical detection limits. EPA concludes that these pollutants will be effectively controlled by limitation of TSS as an "indicator" pollutant even though the toxics are not expressly regulated by numerical limitations.

Many of the toxic pollutants, such as pentachlorophenol and 2,4,6-trichlorophenol, are adsorbable on suspended solids and will be controlled by TSS as an indicator.

In the future, EPA anticipates that when adequate data are available to set alternate limitations on additional specific toxic pollutants or to limit a few statistically supported "surrogate" pollutants it will be possible to cease relying on nonconventional or conventional pollutants, such as TSS, as "indicators" and only control conventional pollutants through BCT limitations.

When limitations on indicator pollutants are violated, additional monitoring may be required. The provisions of such monitoring requirements will be specified in each permit and may include analysis for some or all of the toxic pollutants or the use of biomonitoring techniques. The additional monitoring is designed to determine the cause of the violation, necessary corrective measures, and the identity and quantity of toxic pollutants discharged. Each violation will be evaluated on a case-by-case basis by the permitting authority to determine whether or not the additional monitoring contained in the permit is required in that particular case.

Section IX of the Development document presents additional discussion about the use of "indicator" pollutants for predicting the control of toxic pollutants.

The "indicator" pollutant TSS is classified as a "conventional" pollutant under Section 304(a)(4) of the Act. Because control of this "indicator" conventional pollutant is necessary to control the toxic pollutants of concern in this industry, EPA is establishing BAT limitations on this basis. It is the Agency's position that when control of conventional pollutants is necessary to control toxics, BAT limitations may be established for conventional pollutants without regard to the BCT cost test.

(C) PSES and PSNS—The pollutants controlled by proposed PSES and PSNS are total chromium, total copper, and total zinc. The limitations are expressed as maximum monthly and maximum daily concentrations (milligrams per liter). Mass limitations are provided as guidance for POTWs that may wish to impose them along with, or instead of, the concentration limitations.

XIV. Pollutants and Subcategories Not Regulated

The Settlement Agreement contained provisions authorizing the exclusion from regulation, in certain instances, of toxic pollutants and industry subcategories. These provisions have been rewritten in a Revised Settlement Agreement which was recently approved by the District Court for the District of Columbia on March 9, 1979.

A. *Pollutants Excluded.* Paragraph 8(a)(iii) of the Revised Settlement Agreement allows the Administrator to exclude from regulation toxic pollutants not detectable by Section 304(h) analytical methods or other state-of-the-art methods. The toxic pollutants not detected and, therefore, excluded from regulation are listed in Appendix C to this notice.

Paragraph 8(a)(iii) of the Revised Settlement Agreement also allows the Administrator to exclude from regulation toxic pollutants detected in the effluent from a small number of sources and uniquely related to those sources. Appendix D lists the toxic pollutants that were detected in the raw or treated wastewaters of only one mill, which are uniquely related to those mills where detected, and which, therefore, are excluded from regulation.

Paragraph 8(a)(iii) of the Revised Settlement Agreement also allows the Administrator to exclude from regulation toxic pollutants detected in only trace amounts not likely to cause toxic effects. Appendix E is a list of toxic pollutants found in trace amounts (at or below the limit of analytical detection and quantification) which are not likely to cause toxic effects, and which, therefore, are excluded from regulation.

The limitations in this regulation have been developed to cover the general case for this industry category. In specific cases, it may be necessary for the NPDES permitting authority to establish permit limits on toxic pollutants which are not subject to limitation in this regulation (see Relationship to NPDES Permits).

B. *Subcategories Excluded.* While the Settlement Agreement required EPA to regulate the entire textile industry listed under the U.S. Department of Commerce, Bureau of the Census Standard Industrial Classification (SIC) code numbers 22 and 23, Paragraph 8(a)(iv) of the Revised Settlement Agreement authorizes EPA to exclude portions of the industry from regulation. Plants in the Apparel and Other Finished Products Made from Fabrics and Similar Materials Category (SIC 23) are engaged primarily in cutting up and assembling finished fabric into apparel and other products. EPA surveyed a limited number of plants and queried trade associations, and found that plants in this subcategory are predominantly dry operations. No plant generates or discharges a significant quantity of process-related wastewater.

Within the Textile Mill Products Category (SIC 22), group or industry numbers 221, 222, 223, 224, 2253, 2271, 2281, 2282, and 2283 are greige mills that are included in the Low Water Use Processing Subcategory. This subcategory was surveyed (see Data Gathering Efforts) and raw and treated effluent samples were collected and analyzed for toxic pollutants at a limited number of mills. It was found that process-related wastewater discharges are generally low in volume and contain only small concentrations of toxic pollutants. While up to 200 mills may discharge process wastewater, typical flows amount to only 3,000 to 4,000 gallons per day. Typical concentrations range from less than 0.05 mg/l for 6 measured organic toxic pollutants to about 0.1 mg/l for 10 metallic toxic

pollutants. At these levels, the total daily discharge of any toxic pollutant from all 200 mills would be less than one pound.

Also surveyed were the Padding and Upholstery Filling Industry (SIC 2293) and the Cordage and Twine industry (SIC 2298). Mills in both of these industry groups were found not to generate process-related wastewater. All other facilities covered by SIC 22 are either dry operations and are known not to generate process-related wastewater or are covered in one of the major textile industry subcategories.

The Agency has concluded that plants in the Apparel Category (SIC 23) and facilities in Padding and Upholstery Filling (SIC 2293) and Cordage and Twine (SIC 2298) industries of the Textile Mills Category (SIC 22) should be excluded from regulation because they do not generate process-related wastewater. Facilities in Subcategory 3 (Low Water Use Processing) should be excluded from BAT regulation under Paragraph 8[a](iv) of the Revised Settlement Agreement because they do not discharge significant quantities of process wastewater or toxic pollutants.

XV. Monitoring Requirements

The Agency intends to establish a regulation requiring permittees and to conduct additional monitoring when they violate permit limitations on "indicator" pollutants. The provisions of such monitoring requirements will be specified for each permittee and may include analysis for some or all of the toxic pollutants or the use of biomonitoring techniques. The additional monitoring is designed to determine the cause of the violation, necessary corrective measures, and the identity and quantity of toxic pollutants discharged. Each violation will be evaluated on a case-by-case basis by the permitting authority to determine whether or not the additional monitoring contained in the permit is necessary. A more lengthy discussion of this requirement appears at 44 FR 34407, June 14, 1979. The Agency intends to amend 40 CFR Part 403, General Pretreatment Regulations. The Part 403 amendment will require that parameters limited by the pretreatment standards be monitored at indirect discharging plants.

XVI. Costs, Effluent Reduction Benefits, and Economic Impacts

Executive Order 12044 requires EPA and other agencies to perform Regulatory Analyses of certain regulations. (See 43 FR 12661 (March 23, 1978)). EPA's proposed regulations for implementing Executive Order 12044 require a Regulatory Analysis for major significant regulations involving annualized compliance costs of more than $100 million or meeting other specified criteria. (See 43 FR 29891 (July 11, 1978)). Where these criteria are met, the proposed regulations require EPA to prepare a formal Regulatory Analysis, including an economic impact analysis and an evaluation of alternatives such as: (1) Alternative types of regulations, (2) alternative stringency levels, (3) alternative timing, and (4) alternative methods of ensuring compliance.

The proposed regulations for the textile industry do not meet the proposed criteria for a formal Regulatory Analysis. Nonetheless, this proposed rulemaking satisfies the formal regulatory analysis requirements. While the Clean Water Act does not permit consideration of alternative timing or alternative methods of ensuring compliance, EPA has considered alternative stringency levels and alternative types of regulations, as discussed above. Moreover, the Agency has performed a detailed analysis of the economic impact of these proposed regulations.

EPA's economic impact assessment is set forth in *Economic Impact Analysis of Proposed Effluent Limitations Guidelines, New Source Performance Standards and Pretreatment Standards for the Textile Mills Point Source Category*, October 1979, EPA 440/2-79-020. This report details the investment and annualized costs for the industry as a whole and for model plants covered by the proposed textile mills regulations. The data underlying the analysis were obtained from the Development Document, publicly available financial studies and surveys, and the results of EPA's economic survey program described under Data Gathering Efforts. The report assesses the impact of compliance costs in terms of plant closures, production changes, price changed, employment changes, local community impacts, and balance of trade effects.

The methodology used in the economic analysis employs basic capital budgeting techniques to determine whether or not facilities will continue operation following imposition of pollution control requirements, and to evaluate reductions in profitability. The Agency developed model plants which represent production type (i.e., wool scouring, wool finishing, woven fabric finishing, etc.), ownership of goods processed (commission or own fabric), complexity of operation (nonintegrated or integrated), discharge status (direct or indirect), and production size.

The decision criteria for plant closures are based on net present value analysis (NPV) and cash flow analysis. Cash flow analysis measures the total annual expenditures and total revenues, the difference being the "net cash flow." Under NPV analysis, the net cash flows for each year (over the life of an investment) are discounted at the industry cost of capital. Plants are projected to close or refrain from entry if both the NPV and the sum of the NPV and annual cash flow are negative. Where best estimates were not available, EPA made conservative assumptions which may tend to project more closures than might actually occur.

The Agency projects that compliance with the proposed effluent limitations may require 321 of the 1,165 wet-processing plants to make pollution control expenditures. The Agency further estimates that the remaining plants will be able to meet the proposed limitations without additional expenditure.

The Agency estimates that the total investment costs for all the proposed regulations will approximate $86 million, and that associated annualized costs (including interest, depreciation, operation, and maintenance) will equal $40 million. The Agency's analysis projects no increases in the price of textile goods. Though this assumption represents the worst case and some price increases may be possible, the highly competitive nature of the industry and import pressure make price pass-through abilities small. As a result, profitability may decline for most of the 321 plants.

Further, EPA projects that the proposed regulations may result in closure of as many as 39 of 321 affected plants, which could cause 6,310 job losses (1.5 percent of the industry employment) and displace 1.4 percent of industry production. Some of the plants that may close are located in small towns and, therefore, several communities may be affected. However, excess capacity in the industry may allow the remaining plants to absorb some production and employment losses due to the projected closures, with the remainder of the production losses being absorbed by increased imports. Balance of trade may be affected as a result. EPA does not expect the proposed regulations to seriously affect the rate of entry into the industry, nor slow considerably the rate of industry growth. In the past, the industry has sustained its viability through improvements in productivity. Diversion of capital funds from this purpose could accelerate the industry's decline. The costs, effluent

reduction benefits, and economic impacts for each proposed regulation are summarized below.

(A) BAT—There are approximately 239 plants that discharge wastewater to the Nation's waters and are thus subject to proposed BAT limitations. EPA estimates that 25 of these plants are meeting the proposed limitations with BPT technology or more advanced technology. The following estimated costs and impacts assume 214 plants have insufficient treatment in place to meet the proposed BAT requirements.

EPA estimates that compliance with proposed BAT limitations may require 214 of the 239 direct dischargers to invest a total of $48 million, assuming BPT is already in place. This investment will range from a low of 1.5 percent of the current book value of fixed assets to a high of 142 percent per discharger. Annualized costs for the 214 direct dischargers may equal a total of $21 million, ranging from a low of 0.1 percent to a high of 7.3 percent of sales per discharger. Current return on sales may fall from a range of −0.9 to 5.9 percent with current BPT compliance to a range of −3.8 to 5.0 percent with proposed BAT compliance. The BAT requirements may cause 19 plant closures and the unemployment of approximately 3,401 persons (0.8 percent of industry wet processing employment), and the displacement of 1.1 percent of industry production. These closures may affect the local communities in which the mills are located because alternative employment may not be available. The Agency does anticipate that some employment and production may be absorbed by the remaining domestic textile mills. In view of this, the Agency does not expect the proposed BAT regulations to seriously affect the balance of trade.

Achievement of proposed BAT effluent limitations will remove approximately 635 additional tons per year of toxic pollutants including 490 tons of organic and 145 tons of metallic toxic pollutants.

(B) NSPS—EPA estimates that NSPS investment costs will range between 3.1 and 16.8 percent of the book value of fixed assets of a new textile mill, depending upon plant size and production process. NSPS annualized costs are expected to range between 0.9 and 4.4 percent of total sales. The Agency expects that return on sales will range between 1.8 and 6.7 percent with proposed NSPS compliance, instead of 3.3 to 7.4 percent with current NSPS compliance. These reduced profits may inhibit the rate of entry into the Felted Fabric Processing Subcategory and consequently slow the rate of industry growth. EPA does not anticipate that the proposed NSPS regulations will seriously affect production, employment, local communities, or balance of trade for the other subcategories in the industry.

(C) PSES—There are approximately 926 plants that discharge process-related wastewater to POTWs and are thus subject to the proposed PSES regulations. The Agency estimates that 819 of these plants will be able to meet the proposed limitations without new expenditures for pollution control. This estimate is based on analysis of the metals data for the plants sampled during the field sampling program and on the pretreatment technology presently in place. From analysis of the metals data, it was established that approximately 80 percent of the plants sampled had raw waste concentrations of total chromium, total copper, and total zinc, below the levels proposed for regulation. By applying this percentage to the total indirect discharger population and including plants that have technology in-place to control these metals to the proposed limitation, it was estimated that only 107 indirect dischargers will need to make pollution control expenditures.

EPA estimates that the total investment costs for these plants to comply with the proposed PSES regulations will be approximately $38 million. This investment will range from a low of 2.0 percent of current book value of fixed assets to a high of 211 percent per discharger. PSES annualized costs may equal $19 million and range from a low of 0.2 percent of sales to a high of 15.8 percent per discharger. Current return on sales may fall from a range of −1.6 to 4.1 percent with current PSES compliance to a range of −11.8 to 3.7 percent with proposed PSES compliance. Compliance may result in the closure of as many as 20 plants, causing the unemployment of approximately 2,909 persons (0.7 percent of industry employment) and displacement of 0.6 percent of industry production. These closures may affect the local communities in which the mills are located and to some extent affect certain regions of the United States (e.g. the Southern and New England areas). It is possible that some employment and production loss may be absorbed by the remaining mills, but the Agency does expect the proposed PSES regulations to affect the balance of trade.

Achievement of proposed PSES regulations is expected to remove 360 tons per year of chromium, copper and zinc from municipal sludges or approximately 55 percent of the total burden of toxic metals generated by those plants discharging to POTW. In addition, the majority of the other heavy metals (nickel, lead) and 200 tons of insoluble toxic organic compounds will also be removed from POTW sludges.

(D) PSNS—EPA estimates that PSNS investment costs will range between 1.2 and 12.6 percent of the book value of fixed assets of a new textile mill. PSNS annualized costs are expected to range between 0.4 and 3.0 percent of total sales. The Agency projects that return on sales may range between 1.9 and 7.1 percent with proposed PSNS compliance, instead of 2.7 to 8.5 percent with current PSNS compliance. These reduced profits may slightly reduce the rate of entry into the Stock and Yarn Finishing Subcategory, but will not significantly slow the rate of industry growth. EPA does not anticipate that the proposed PSNS regulations will seriously affect prices, production, employment, local communities, or balance of trade for the other subcategories in the industry.

XVII. Nonwater Quality Aspects of Pollution Control

The elimination or reduction of one form of pollution may aggravate other environmental problems. Therefore, Sections 304(b) and 306 of the Act require EPA to consider the non-water quality environmental impacts (including energy requirements) of certain regulations. In compliance with these provisions, EPA has considered the effect of these regulations on air pollution, solid waste generation, and energy consumption. While it is difficult to balance pollution problems against each other and against energy use, EPA is proposing regulations that it believes best serve often competing national goals.

The following are the non-water quality environmental impacts associated with the proposed regulations:

(A) Air Pollution—Imposition of BAT, BCT, NSPS, PSES, and PSNS are not anticipated to result in any additional air pollution from the textile industry. It is possible that some plants may choose to incinerate waste treatment sludges, but this is doubtful since there are more economical alternatives for disposal.

(B) Solid Waste—A study by EPA's Office of Solid Waste Management (1976) estimated that the textile industry generated 1,760,000 metric tons of solid wastes (wet basis) in 1974. These wastes were comprised of innocuous process-related materials such as dirt, vegetable matter, fiber, flock, yarn, fabric, etc. (8.5 percent); potentially hazardous dye and chemical containers

with residual dyestuff and chemicals (0.5 percent); and potentially hazardous wastewater treatment sludges (91 percent). The study projected that in 1977 the industry would generate 1,940,000 metric tons of solid wastes with essentially the same percent distribution.

The sludges contain heavy metals, including arsenic, cadmium, chromium, cobalt, copper, lead, mercury, nickel, and zinc, and chlorinated organics such as trichlorobenzene, polyvinyl chloride, and perchloroethylene. Current sludge management practices in the industry include: Storing or retaining sludge in disposal ponds or in the bottom of ponds or lagoons that are used for aeration; dumping sludge on land generally off the plant site; spreading sludge on land for fertilizer value, again generally off the plant site; and sending sludge to general purpose landfills.

EPA estimates that the proposed BAT and PSES limitations will contribute an additional 40,000 and 365,000 metric tons of sludge per year, respectively. These sludges will contain higher concentrations of toxic metals and organic toxic pollutants, which will limit disposal options. However, implementation of the proposed PSES will result in POTW sludges having commensurately lesser quantities and concentrations of toxic pollutants. POTW sludges will become more amenable to a wider range of disposal alternatives, possibly including beneficial use on agricultural lands. Many POTWs currently receive textile industry wastewaters with little or no pretreatment. Under these conditions, sludge characteristics can limit sludge disposal alternatives available to these POTWs. Moreover, disposal of these vastly greater quantities of adulterated POTW sludges is significantly more difficult and costly than disposal of smaller quantities of wastes generated at individual plant sites.

Regulations proposed by EPA under Section 3001 of the Resource Conservation and Recovery Act (RCRA) list textile industry solid wastes as "hazardous" (43 FR 58946, 58959 (December 18, 1978)). These wastes, primarily the sludges from wastewater treatment, will be subject to handling, transportation, storage, and disposal requirements, under sections 3002–3004 of RCRA. EPA's proposed generator standards would require generators of textile industry wastes (dye and chemical containers and sludges) to meet containerization, labeling, and reporting requirements, and, if they dispose of wastes off-site, to prepare a manifest that will track the movement of the wastes from the generator's premises to a permitted off-site treatment, storage, or disposal facility. (See 43 FR 58946, 58979 (December 18, 1978)). The proposed transporter regulations would require transporters of textile industry wastes to comply with the manifest and assure that the wastes are delivered to a permitted facility. (See 43 FR 18506 (April 28, 1978)). Finally, the proposed treater, storer, and disposer standards would establish technical design and performance standards for textile waste storage facilities, and for landfills, basins, surface impoundments, incinerators, and other facilities where such wastes would be treated or disposed, as well as security, contingency plan, employee training, record keeping, reporting, inspection, monitoring, and financial liability requirements for all such facilities. (See 43 FR 58946, 58982 (December 18, 1978)).

EPA's Office of Solid Waste is preparing a pilot analysis of the solid waste management and disposal costs required for the textile industry to comply with RCRA. The costs of compliance with proposed RCRA regulations were not specifically included in the economic impact analysis for these proposed regulations. However, EPA considered estimated RCRA compliance costs when it selected the technology options for these proposed regulations.

(C) Energy Requirements—EPA estimates that the achievement of proposed BAT, BCT, PSES, and PSNS will each increase electrical energy consumption by approximately 0.2 to 0.5 percent of present facility use for all subcategories. Proposed NSPS will increase consumption by approximately 0.8 to 1.4 percent.

XVIII. Best Management Practices

Section 304(e) of the Clean Water Act authorizes the Administrator to prescribe what have been termed "best management practices (BMPs)" described under Authority and Background. EPA intends to develop BMPs which are: (1) Generic in nature and applicable to all industrial sites; (2) specific in nature and applicable to a specified industrial category; and (3) guidance to permit authorities in establishing BMPs required by unique circumstances at a given plant.

The Agency anticipates regulation of generic BMPs in the textile industry. The primary area of concern is the potential for leaks and spills from on-site storage of processing chemicals. Those plants which purchase and store liquid chemicals in bulk may be required to provide protective measures to contain leaks and spills such as dikes and curbs.

XIX. Upset and Bypass Provisions

An issue of recurrent concern has been whether industry guidelines should include provisions authorizing noncompliance with effluent limitations during periods of "upset" or "bypass." An upset, sometimes called an "excursion," is unintentional noncompliance occurring for reasons beyond the reasonable control of the permittee. An upset provision is necessary, it has been argued, because such upsets will inevitably occur due to limitations in control technology. Because technology-based limitations are to require only what technology can achieve, it is claimed that liability for such situations is improper. When confronted with this issue, courts have divided on the question of 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 Company v. EPA*, 564 F.2c 1253 (9th Cir. 1977) with *Weyerhaeuser v. Costle*, 11 ERC 2149 (D.C. Cir. 1978), and see *American Petroleum Institute v. EPA*, 540 F.2d 1023 (10th Cir. 1976); *CPC International, Inc. v. Train*, 540 F.2d 973 (4th Cir. 1976)).

While an upset is an unintentional episode during which effluent limits are exceeded, a bypass is an act of intentional noncompliance during which wastewater treatment facilities are circumvented in emergency situations. Bypass provisions have, in the past, been included in NPDES permits.

EPA has determined that both upset and bypass provisions should be included in NPDES permits, and has recently promulgated NPDES regulations which include upset and bypass permit provisions. (See 44 FR 32854 (June 7, 1979)). 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 industry will be entitled to upset and bypass provisions in NPDES permits, these proposed regulations do not specifically address these issues.

XX. Variances and modification

Upon the promulgation of these regulations, the numercial effluent limitations for the appropriate subcategory must be applied in all federal and state NPDES permits issued to textile industry direct dischargers. In addition, on promulgation, the

pretreatment limitations are directly applicable to indirect dischargers.

For the BCT effluent limitations, the only exception to the binding limitations is EPA' "fundamentally different factors" variance. (See *E. I. duPont de Nemours and Co. v. Train*, 430 U.S. 112 (1977)). This variance recognizes factors concerning a particular, discharger which 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 now will be included in the NPDES regulations and not the specific textile industry regulations. (See 44 FR 32854, 32950 (June 7, 1979) for the text and explanation of the "fundamentally different factors" variance.)

The BAT limitations in these regulations also are subject to EPA's "fundamentally different factors" variance. In addition, BAT limitations for non-toxic pollutants are subject to modifications under Section 301(c) and 301(g) of the Act. Under Section 301(1) of the Act, these statutory modifications are not applicable to "toxic" pollutants. Likewise limitations on conventional and nonconventional pollutants used as "indicators" for toxic pollutants are not subject to Section 301(c) or Section 301(g) modifications, unless the discharger demonstrates that a waste stream does not contain any of the toxic pollutants for which the "indicator" was designed to demonstrate removal.

Pretreatment standards for existing sources are subject to the "fundamentally different factors" variance and credits for poollutants removed by POTWs. (See 40 CFR 403.7, 403.13; 43 FR 27736 (June 26, 1978)). Pretreatment standards for new sources are subject only to credit provision in 40 CFR 403.7. New source performance standard are not subject to EPA's "fundamentally different factors" variance or any statutory or regulatory modifications. (See *duPont v. Train, supra.*)

XXI. Relationship to NPDES Permits

The BAT, BCT, and NSPS limitations in these regulations will be applied to individual textile plants through NPDES permits issued by EPA or approved state agencies, under Section 402 of the Act. The preceding section of this preamble discusses the binding effect of these regulations on NPDES permits, except to the extent that variances and modifications are expressly authorized. This section describes several other aspects of the interaction of these regulation and NPDES permits.

First, one matter that has been subject to different judicial views is the scope of NPDES permit proceedings in the absence of effluent limitations guidelines and standards. Under currently applicable EPA regulations, states and EPA Regions issuing NPDES permits prior to promulgation of these regulations must include a "reopener clause," providing for permits to be modified to incorporate these regulations when they are promulgated. (See 43 FR 22159 (May 23, 1978)). To avoid cumbersome modification procedures, EPA has adopted a policy of issuing short-term permits only after promulgation of these and other BAT regulations. The Agency has published rules designed to encourage states to do the same. (See 43 FR 58066 (December 11, 1978)). However, in the event that EPA finds it necessary to issue long-term permits prior to promulgation of BAT regulations, EPA and states will follow essentially the same procedures used in many cases of issuing initial permit. The appropriate technology levels and limitations will be assessed by the permit issuer on a case-by-case basis and on consideration of the statutory factors. (See *U.S. Steel Corp. v. Train*, 556 F. 2d 822, 844, 854 (7th Cir. 1977)). In these situations, EPA documents and draft documents (including these proposed regulations and supporting documents) are relevant evidence, but not binding, in documents) are relevant evidence, but not binding, in NPDES permit proceedings. (See 44 *FR* 32854 (June 7, 1979)).

Another noteworthy topic is the effect of these regulations on the powers of NPDES permit-issuing authorities. The promulgation of these regulations does not restrict the power of any permit-issuing authority to act on these or any other EPA regulations, guidelines, or policy, in any manner consistent with law. For example, the fact that these regulations do not control a particular pollutant does not preclude the permit issuer from limiting such pollutant on a case-by-case basis, when necessary to carry out the purposes of the Act. In addition, to the extent that state water quality standards or other provisions of state or Federal law require limitations (or require more stringent limitations on covered pollutants), such limitations must be applied by the permit-issuing authority.

One additional topic that warrants discussion is the operation of EPA's NPDES enforcement program, many aspects of which have been considered in developing these regulations. The Agency wishes to emphasize that, although the Clean Water Act is a strict liability statute, the initiation of enforcement proceedings by EPA is discretionary. EPA has exercised and intends 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.

XXII. Small Business Administration Financial Assistance

There are two SBA programs that may be important sources of funding for the Textiles Industry Point Source Category. They are the SBA's Economic Injury Loan Program and Pollution Control Financing Guarantees.

Section 8 of the FWPCA authorizes the SBA through its Economic Injury Loan Program, to make loans to assist any small business concern in effecting additions to or alterations in equipment, facilities, or methods of operation in order to meet water pollution control requirements under the Federal Water Pollution Control Act if the concern is likely to suffer a substantial economic injury without such assistance. This program is open to small business firms as defined by the Small Business Administration. Loans can be made either directly by SBA or through a bank using an SBA guarantee. The interest on direct loans depends on the cost of money to the federal government and is currently set at 7⅜ percent. Loan repayment periods may extend up to thirty years depending on the ability of the firm to repay the loan and the useful life of the equipment. SBA loans made through banks are at somewhat higher interest rates.

Firms in the Textiles Industry Point Source Category may be eligible for direct or indirect SBA loans. For further details on this Federal loan program write or telephone any of the following individuals at EPA Headquarters or in the ten EPA Regional offices:

Coordinator—Mr. Sheldon Sacks, Environmental Protection Agency, Financial Assistance Coordinator, Office of Analysis and Evaluation (WH-586), 401 M Street SW., Washington, D.C. 20460, Telephone: (202) 755-3624.

Region I—Mr. Ted Landry or Gerald DeGaetno, Environmental Protection Agency, J. F. Kennedy Federal Office Building, Room 2203, Boston, Massachusetts 02203, Telephone: (617) 223-5061.

Region II—Mr. Kenneth Eng, Chief, Air and Environmental Applications Section, Environmental Protection Agency, 26 Federal Plaza, New York, New York 10007, Telephone: (212) 264-4711.

Region III—Mr. Chuck Sapp, Environmental Protection Agency, Curtis Building, 3EN40, 6th and Walnut Streets, Philadelphia, Pennsylvania 19106, Telephone: (215) 597-9433.

Region IV—Mr. John Hurlebaus, Environmental Protection Agency, 345 Courtland Street NE., Atlanta, Georgia 30308, Telephone: (404) 881-4793.
Region V—Mr. Chester Marcyn, Contingency, Plan Coordinator, Surveillance and Analysis Branch, Enforcement Division, Environmental Protection Agency, 536 South Clark Street, Chicago, Illinois 60605, AC (213) 353-2316.
Region VI—Ms. Jan Horn, Attorney, Water Enforcement Division, Water Program Branch, Environmental Protection Agency, 1st International Building, 1201 Elm Street, Dallas, Texas 75270, Telephone: (214) 767-2760.
Region VII—Mr. Donald Sandifer, Sanitary Engineer, Water Division, Engineering Branch, Environmental Protection Agency, 324 East 11th Street, Kansas City, Missouri 64106, Telephone: (816) 374-2725.
Region VIII—Mr. Gerald Burke, Sanitary Engineer, Office of Grants, Water Division, Environmental Protection Agency, 1860 Lincoln Street, Denver, Colorado 80203, Telephone: (303) 837-3961.
Region IX—Mr. Stan Leibowitz or Ray Seid, Permits Branch, Enforcement Division, Environmental Protection Agency, 215 Fremont Street, San Francisco, California 94111, Telephone: (415) 556-3450.
Region X—Mr. Dan Bodien, Special Technical Advisor, Enforcement Division, Environmental Protection Agency, 1200 6th Avenue, Seattle, Washington 98101, Telephone: (206) 442-1270.
Headquarters—Mr. Donnel Nantkes, Legal Counsel; Grants Contracts and General Administration Division, Environmental Protection Agency, 401 M Street SW., Washington, D.C. 20460, Telephone: (202) 426-8830.

Interested persons may also contact the Assistant Regional Administrators for Finance and Investment in the Small Business Administration Regional offices for more details on federal loan assistance programs. For further information, write or telephone any of the following individuals:

Region I—Mr. Russell Berry, Assistant Regional Administrator for Finance and Investment, Small Business Administration, 60 Batterymarch, 10th Floor, Boston, Massachusetts 02203, Telephone: (617) 223-3891.
Region II—Mr. John Axiotakis, Assistant Regional Administrator for Finance and Investment, Small Business Administration, 26 Federal Plaza, New York, New York 10007, Telephone: (212) 264-1452.
Region III—Mr. David Malone, Assistant Regional Administrator for Finance and Investment, Small Business Administration, 231 St. Asapas Road, West Lobby, Suite 646, Bala Cynwyd, Pennsylvania 19004, Telephone: (215) 596-5908.
Region IV—Mr. Merritt Scoggins, Assistant Regional Administrator for Finance and Investment, Small Business Administration, 1401 Peachtree Street, NE., Atlanta, Georgia 30309, Telephone: (404) 881-2009.
Region V—Mr. Larry Cherry, Assistant Regional Administrator for Finance and Investment, Small Business Administration, 219 South Dearborn Street, Chicago, Illinois 60604, Telephone: (312) 353-4533.
Region VI—Mr. Donald Beaver, Assistant Regional Administrator for Finance and Investment, Small Business Administration, 1720 Regal Row, Suite 230, Dallas, Texas 75202, Telephone: (214) 749-1265.
Region VII—Mr. Richard Whitley, Assistant Regional Administrator for Finance and Investment, Small Business Administration, 911 Walnut Street, 23rd Floor, Kansas City, Missouri 64106, Telephone: (816) 374-3927.
Region VIII—Mr. James Chuculate, Assistant Regional Administrator for Finance and Investment, Small Business Administration, 1405 Curtis Street, Executive Tower Building—22nd Floor, Denver, Colorado 80202, Telephone (303) 327-3988.
Region IX—Mr. Charles Hertzberg, Assistant Regional Administrator for Finance and Investment, Small Business Administration, 450 Golden Gate Avenue, San Francisco, California 94102, Telephone: (415) 556-7782.
Region X—Mr. Jack Welles, Regional Administrator for Finance and Investment, Small Business Administration, 710 2d Avenue, Dexter Horton Bldg., 5th floor, Seattle, Washington 98104, Telephone: (206) 399-5679.

In addition to the Economic Injury Loan Program, the Small Business Investment Act, as amended by Pub. L. 94-305, authorizes SBA to guarantee the payments on qualified contracts entered into by eligible small businesses to acquire needed pollution facilities when the financing is provided through taxable and tax-exempt revenue or pollution control bonds. This program is open to all eligible small businesses. Bond financing with SBA's guarantee of the payments makes available long term (20-25 years), low interest (usually 5 to 7 percent) financing to small businesses on the same basis as that available to larger national or international companies. For further details on this program write to the SBA, Pollution Control Financing Division, Office of Special Guarantees, 1815 North Lynn St., Magazine Bldg., Rosslyn, VA 22209, (703) 235-2900.

XXIII. Summary of Public Participation

During June of 1978, the Agency circulated a draft technical contractor's report entitled "Second Interim Report, Textile Industry BATEA-NSPS-PSES-PSNS Study" to a number of interested parties, including the American Textile Manufacturers Institute (ATMI), the Northern Textile Association (NTA), Carpet and Rug Institute (CRI), various member firms of these groups, state water pollution control agencies, and some municipal authorities for public comment. In November of 1978, the Agency circulated a draft version of the technical contractor's report entitled "Technical Study Report, BATEA-NSPS-PSES-PSNS" to a similar group, again for public comment. The Agency accepted written comments on the draft reports through early December of 1978, and a meeting was held in Washington, D.C., on December 12, 1978, for public presentation and discussion of comments on the final report. Neither document included recommendations for effluent limitations guidelines, new source performance standards, or pretreatment standards, but rather presented a technical basis for the currently proposed regulations. A summary of the comments received to date is presented here.

1. Comment: Several commenters were concerned about the methodology used to establish the significance of toxic pollutants associated with the industry's wastewaters.

Response: The classification of toxic pollutants is based on an extensive evaluation of the analytical results obtained throughout the study, on information provided by special task groups of the American Textile Manufacturers Institute (ATMI) and the Dyes Environmental and Toxicology Organization (DETO), and, to a much lesser extent, on questionnaire information. The questionnaire information was used to gain insight from knowledgeable industry personnel about the use and possible presence of the toxic pollutants in textile processing. The analytical results from the field sampling program and information supplied by special task groups of ATMI and the Ecology Committee of DETO were used to classify each of the 129 toxic pollutants into one of five groups. Group 1 includes those pollutants detected frequently in raw wastewaters and at least once in effluents from secondary treatment at concentrations of 10 μg/l or greater. The 10 μg/l level was selected as an interim limit for the textile industry and allowed the Agency to focus on those pollutants that can cause the most serious problems. Group 2A includes those pollutants detected in the raw wastewater or effluents from secondary treatment at two mills or more, but at less than 10 μg/l in the treated effluents. Group 2B includes those pollutants detected in the raw wastewater or treated effluent at only one mill and at less than 10 μg/l in the treated effluent or those established as potentially present in textile effluents by ATMI or DETO. Group 2C includes those pollutants not detected in the field sampling program but suggested as possibly present as an intermediate or contaminant in some textile chemicals by ATMI, DETO, or by information provided on the questionnaires. Group 3

includes those pollutants that were not detected in the field-sampling program and were not suggested as possibly present by ATMI, DETO, or by information provided on the questionnaires.

2. Comment: Several commenters were concerned that the variability in the wastewater characteristics among plants within subcategories will cause difficulty in establishing meaningful costs and treatment effectiveness.

Response: Variability in wastewater characteristics exists and is reflected in the expanded subcategorization of the industry. The Agency has used a comprehensive model plant approach to estimate costs and selected median waste characteristics and water usage values as typical for each subcategory. Median values provide the best possible estimates of the wastewater characteristics for each subcategory on the whole. Maximum or minimum values are unsatisfactory, and average values are not typical because they are distorted by unusually high or low values at individual plants. From two to four model plants, representing various production levels, were selected for each subcategory, and treatment costs were determined using treatment effectiveness values established during the EPA/Industry Pilot Plant Studies and from long-term performance data provided from the industry questionnaires and from plant visits.

3. Comment: One comment dealt with the classification of water-jet weaving in the framework of the subcategorization. Specifically, there was concern whether this operation would be classified as a low water use processing operation or as a separate subcategory.

Response: Water-jet weaving was considered as part of the Low Water Use Processing Subcategory, and one plant using such equipment was sampled during the screening phase to examine the significance of this operation. Few toxic pollutants were detected and conventional pollutant levels were low, so the Agency has recommended that this operation be excluded from the BAT and pretreatment regulations based on Paragraph 8(a) (iv) of the Revised Settlement Agreement (see Pollutants and Subcategories Not Regulated).

4. Comment: There was considerable concern by several commenters that "commission finishing" is no longer considered as a subcategory of the industry.

Response: The term "commission finisher" refers to a textile facility that finishes material (i.e., fabric, yarn, carpet) owned by others. Such facilities were investigated during the study and no significant differences were recognized in their wastewater characteristics or processing that are not addressed by the internal subdivisions of the various subcategories. However, the Agency is presently involved in a cooperative program with the industry to develop additional information about commission finishers. If it is determined from the results of this program that commission finishers have not been correctly addressed, appropriate adjustments will be made and the regulations changed.

5. Comment: One commenter suggested that the Agency consider allowing the industry to establish a correlation between COD and toxic pollutants to ease the possible costly burden of routinely monitoring for all toxic pollutants.

Response: EPA recognizes the difficulty and expense associated with monitoring for the toxic pollutants, and has proposed a new method that uses "indicator" pollutants to regulate certain toxic pollutants. The "indicator" pollutant proposed for the textile industry is TSS. The data available to EPA generally show that when this "indicator" pollutant is controlled, the concentrations of toxic pollutants are significantly lower than when TSS is present in high concentrations. For a more complete discussion of the indicator pollutant approach, see the Regulated Pollutants section of this Preamble.

6. Comment: It was suggested by representatives of the industry that the effect of the discharge of toxic pollutants or environment and health be given more consideration in establishing limitations.

Response: The proposed effluent limitations are based on application of available technology to reduce or remove pollutants classified as conventional, nonconventional, or toxic that may enter the Nation's receiving water bodies directly or through POTWs. While the list of toxic pollutants was established on the basis of potential toxicity, carcinogenicity, mutagenicity, or teratogenicity, there is no Congressional intent in the Clean Water Act to evaluate environmental and health effects in establishing effluent limitations. The limitations are technology-driven and based solely on technological and economic considerations.

7. Comment: There was a general comment that data are lacking to effectively recommend activated carbon adsorption as a viable treatment alternative for textile industry wastewaters. It was also suggested that powdered activated carbon treatment (PACT) be given more consideration.

Response: The Agency has obtained data on the effectiveness of activated carbon adsorption from the EPA/Industry Pilot Plant Research Project, from one full-scale facility that treats wasfe from a woven fabric finishing plant, and from other industries in which the data are transferable to the textile industry. The pilot plant activated carbon adsorption treatment mode was tested on the secondary effluent at 10 textile plants; over 100 composite samples (generally 24-hr) were collected and analyzed to evaluate the effectiveness of the mode. In addition, a total of 25 separate composite samples were collected at eight of the ten plants to evaluate the effectiveness of carbon adsorption in removing toxic pollutants. While there are data available, the Agency has not considered activated carbon adsorption as a control option in proposing effluent limitations because of its high cost and operational difficulties. Activated carbon does remain an effective alternative for some mills to meet the proposed BAT and NSPS effluent limitations.

Powdered activated carbon treatment is employed full-scale in at least one textile plant and was investigated in laboratory bench-scale studies as part of the EPA/Industry Pilot Plant Research Project. It was considered as a possible alternative and the full-scale plant was sampled during the verification phase. Performance data obtained were inconclusive because operation of the process is still in the development phase. The Agency is seeking more information on the performance of the PACT process and is currently supporting a joint PACT research effort between the Office of Research and Development (ORD) and ATMI at two textile plants. The Agency also requests that anyone in the industry with data or experience with the PACT system bring the information to its attention.

8. Comment: There were several comments to the effect that the operation and performance of the BPT technology at many facilities is inadequate, and that the true ability of the BPT technology in controlling the toxic pollutants was not fully evaluated by EPA.

Response: The Agency recognizes that there may be problems with the operation and design of some plants employing the BPT technology and has attempted to take this into account when evaluating the performance of these systems. The Agency has reevaluated these data and also requests that all plants with the BPT technology in place provide additional

data and information regarding the adequacy of the operation and performance of these systems. The current proposed BAT standards will require that some plants make improvements in design and operation of their present biological treatment systems before incorporating the BAT treatment technology. These steps, along with the integration of manufacturing operations with treatment operations and in-plant control measures such as water reduction, chemical substitution, and effective scheduling, should be investigated before additional treatment is installed.

9. Comment: There was general concern by the industry that the cost estimates for the various alternatives are too low and in need of being updated. There were several specific comments on inadequacies of the model plant approach and in the assumptions used in developing cost estimates. It was suggested that the basis for a technology and performance of the technology be expanded to include: (1) Degree of treatment and selection of unit processes, (2) quantities of pollutants to be removed, and (3) loading rates expected. It was generally felt that flow rate alone, or what appears to be flow rate alone in the approach used by the Agency, is inadequate.

Response: For all cost estimates, an attempt was made to achieve accuracy in magnitude, based on typical raw waste and BPT effluent wastewater characteristics. It was necessary to make assumptions in developing the costs in order to maintain consistency and obtain a valid comparison among the alternative technologies and subcategories. The Agency understands that certain assumptions are not ideal for all cases, and may appear high or low in specific comparisons, but maintains that the approach and assumptions used allow a workable methodology and provide useful, meaningful costs that are comparable to the economic profile of the industry. The Agency has done the best it could with the information available but is seeking to better estimate treatment costs, especially with regard to site-specific considerations, and plans to evaluate data currently being obtained from the EPA/Industry Pilot Plant Research Project. In addition, the Agency welcomes additional full-scale cost data and solicits available information from the industry. EPA will consider this new information before making the regulations final.

Many of the initial assumptions made in estimating the effectiveness of several treatment technologies were based on theoretical consideration without the benefit of the findings from the EPA/Industry Pilot Plant Research Project. The Agency has planned, since the beginning of the BAT Revision Study, to use these findings and has done so in developing the proposed regulations. Consequently, many of the specific comments on treatment effectiveness are no longer applicable.

The specific requirements of the Resource Conservation and Recovery Act (RCRA) have only just recently been proposed and the Agency has not yet determined the quantitative effect on the textile industry of complying with the requirements. An effort is under way to do this and findings will be included as best as possible in the final regulations. The Agency expects much more information to be available before promulgation of these regulations. The Agency invites the industry to provide comments and data on sludge characteristics, disposal practices, disposal costs, and concerns associated with compliance with RCRA.

10. Comment: Several commenters questioned whether the treatment alternatives for new sources would produce the results expected by the Agency. They suggested that the eight-hour biological treatment aeration detention time is too low, and that costs be adjusted to reflect a longer detention time.

Response: For new sources, the Agency has proposed the segregation of waste streams containing significant toxic chemicals from the mill's domestic and non-toxic process wastes. The eight-hour aeration time proposed is only for treatment of the more easily biodegraded pollutants that will be present in the domestic and non-toxic pollutant stream. The toxic waste stream, including wastes which biodegrade slowly, will be treated using advanced technology. New sources will be able to incorporate these steps in new construction without the problems that would be experienced at existing plants.

The Agency also circulated a preliminary draft economic contractor's report entitled, "Economic Impact Analysis of Proposed Effluent Limitations Guidelines and New Source Performance Standards for the Textile Mills Industry Point Source Category", dated January 1979, to the American Textile Manufacturers Institute (ATMI) who in turn distributed it to a number of other interested individuals, and to other industry trade associations and individuals. This document did not include recommendations for effluent limitations guidelines, new source performance standards, or pretreatment standards, but rather presented preliminary economic impacts for all the proposed effluent treatment alternatives. A summary of comments received to date is presented below.

1. Comment: While the necessity for using "model plants" was not questioned, one comment stated that the model plant approach generally understates treatment costs and that this approach poses accuracy problems when "synthesizing" data for individual plants.

Response: The use of individual plant analyses would have the advantage of depicting the industry with more accuracy than does the use of model plants. However, sufficient data to analyze every plant are not available. Furthermore, the depiction would be static in nature. Assessing pollution control impacts under the net present value (NPV) approach involves projecting the profile of the industry into the future. This requires the incorporation of a number of parameters to include price and cost increases, growth rates, and proposed control costs. The development of these parameters is feasible only at some level of aggregation; in this case, model plants. The development of model plant pollution control treatment costs utilize similar estimating procedures as would be used for an actual plant. Certain basic assumptions depicting the specific conditions and requirements associated with each model are determined and these are believed to be representative of actual plants associated with the models. A detailed explanation of the development of controls costing procedures is presented in the Development Document for Proposed Effluent Limitations Guidelines, New Source Performance Standards, and Pretreatment Standards for the Textile Industry Point Source Category.

2. Comment: One comment received concerned the inclusion of other regulatory costs (cotton dust controls, toxics, noise abatement) and the impact of these on the BATEA closure decision.

Response: Other regulatory costs included in this impact analyses were those represented in the baseline models as having been already incurred by the industry prior to or during the baseline year (1977). Given the preliminary development stage of many regulatory requirements, costs are impossible to forecast. The economic impact report for proposal describes these various other regulatory requirements that have been assessed.

3. Comment: Several comments were received regarding clarification of the technical aspects of the impact methodology. These included such

issues as: (a) The origin of future cash flows; (b) the assumed growth and inflation rates; (c) the suggestion to forecast individual items in the cash flow and compute these on year-by-year basis; (d) the liquidation value for the terminal year and its difference from the current salvage value; (e) the terminal year liquidation value and inclusion of the salvage value of pollution control facilities; and (f) the justification for use of 21 years in the net present value (NPV) analysis instead of a shorter period.

Response: These comments are answered in summary here. Detailed discussions of these topics are presented in the economic impact analysis and in the appropriate sections of this notice.

(a) Origin of future cash flows: Future cash flows are calculated based on projections of the models' future after-tax profits and depreciations.

(b) Growth and inflation rates: An inflation rate of 6 percent was incorporated into the net present value analysis, this corresponds with the rate utilized in a Staff Report prepared by the Council on Wage and Price Stability entitled, "A Study of the Textile and Apparel Industries," July 1978. Growth in the industry has been generally projected to be between 2 and 3 percent over the next ten years. However, the rate has not been translated into individual subcategory rates and no increases have been applied to the model plants. Any increases associated with wet processors can be expected to be absorbed by increases in utilization rates and new source plants. Consequently, growth rates appropriate for each of the model plants would be minor and would have only minor effects on profitability.

(c) Forecasting items of cash flow: One of the key steps in developing the financial analysis of the model plants was to project the profitability over the life of the plants. These projections, along with the depreciation estimates, determined the cash flows. Although listing individual items in the cash flow might be appropriate for an individual plant in the industry, it is not appropriate for model plants which were developed to represent a number of plants of different ages with a wide variety of individual requirements.

(d) Difference between liquidation value and salvage value: In this study, the salvage value of a plant is synonomous with its liquidation value. Implicit within the model plant concept is that the annual reinvestment will be such that the salvage value of fixed assets will remain at the same level (adjusted for inflation) throughout the period of consideration.

(e) Salvage value of pollution control facilities: The terminal year liquidation value represents the salvage value of the plant assuming the plant will not continue to be used for textiles manufacturing. This plus the fact that most pollution controls tend to reflect relatively fixed, site specific structures make it unlikely that pollution control facilities would have any appreciable liquidation value in the terminal year.

(f) Discount period of NPV analysis: The NPV concept is based on an examination of cash flows over the expected life time of proposed investments. The 21 year time frame was selected since it coincides with the expected life of dyeing and finishing equipment as shown in Department of Treasury, *The Textile Industry,* 1976. It was assumed that this time horizon would be appropriate for existing plants as well as new sources. While individual firms will be making decisions in the short term, the industry as a composite will be making decisions in the long term.

4. Comment: There were several comments provided concerning the severity of specific impacts depicted in the economic report. These comments concerned price impacts, supply and demand analysis, production impacts, employment impacts, and various financial and other impacts. The bases for these comments were the conclusions of the impact analysis presented in the preliminary report.

Response: The Agency has refined the economic analysis presented in the preliminary report. The preliminary impacts assumed all 1,165 wet processors would need to invest in, and operate, pollution control facilities. This estimate has been revised to 319 plants, based on an estimated 846 plants with sufficient treatment currently in place. The Agency has considered the potential economic impacts of each regulatory option evaluated in its decision criteria as described in Sections VIII, X, XI, XII of this notice. Because of economic impacts projected for the Felted Fabric Processing Subcategory under BAT Option 4, Option 1 limitations are proposed for this subcategory. EPA believes that the options selected for the proposed regulations are economically achievable.

XXIV. Solicitation of Comments

EPA invites and encourages public participation in this rulemaking. The Agency asks that any deficiencies in the record of this proposal be pointed to with specificity and that suggested revisions or corrections be supported by data.

EPA is particularly interested in receiving additional comments and information in connection with the following:

(1) The Agency is reviewing the sampling and analytical methods used to determine the presence and magnitude of toxic pollutants, and solicits comments on the data produced by these methods, and the methods themselves.

(2) In order to provide a more extensive data base for this rulemaking, EPA requests that textile facilities voluntarily sample and analyze for the toxic, conventional, and nonconventional pollutants proposed for regulation. Samples should be taken, at a minimum, from intake water, raw wastewater, and pretreated or final effluent where treatment is in place. Voluntary sampling and analyses must be conducted by the same methods used by EPA and, therefore, plants that intend to participate in this effort should contact James R. Berlow (see ADDRESS at beginning of preamble) for further assistance. Sampling and analysis protocols and a list of laboratories capable of performing the analyses will be made available to plants wishing to participate in this program.

(3) In recognition of the limits of available data on some toxic pollutants, the Agency is proposing "indicator" limitations on total suspended solids. EPA requests the submission of data that either support or refute its belief that when TSS is removed to low concentrations, the concentrations of toxic pollutants are substantially less than when the concentrations of the "indicator" pollutant is high. Under the "indicator" strategy, "indicator" pollutants will be treated as toxic pollutants for all purposes. Effluent limitations will be established for them at BAT levels; "indicator" conventionals will not have to pass the BCT cost-comparison test normally required for conventional pollutants, and "indicator" nonconventional pollutants will not be subject to modifications under Sections 301(c) and 301(g) unless a permittee can show that the waste stream does not contain any of the toxic pollutants for which the "indicator" was designed to demonstrate removal. EPA requests comments on this approach.

(4) EPA has noted some anomalies or potentially erroneous data points for conventional, nonconventional and toxic pollutants, and requests that plants review all data submitted to the Agency, including data for flow and production, to insure their accuracy. In addition, EPA has had difficulty in obtaining data for plants in the Low Water Use Processing, Nonwoven

Manufacturing, and Felted Fabric Processing Subcategories, and requests that these plants submit available data including production, wastewater flow, pollutant parameters, and concentrations.

(5) Characterization of the nature and amount of sludges generated by textile waste treatment plants and the costs of sludge handling and disposal are important to these regulations and regulations being developed by EPA's Office of Solid Waste, under authority of the Resource Conservation and Recovery Act (RCRA). The Agency solicits additional data concerning the quantities, pollutant content, and handling and disposal costs for all solid wastes.

(6) Possible underestimation of control technology costs was a significant issue raised during the public comment meeting. In order to perform a meaningful comparison of EPA cost data and industry cost data, EPA requests detailed information on salient design and operating characteristics; actual installed cost (not estimates of replacement costs) for each unit treatment operation or piece of equipment (e.g., screens, clarifiers, aeration equipment, etc.); the date of installation and the amount of installation labor provided by plant personnel; and the actual cost for operation and maintenance broken down into units of usage and cost for energy (kilowatt hours or equivalent), chemicals, and labor (work-years or equivalent).

(7) EPA's economic impact analysis indicated that up to 39 plant closings may result from the proposed regulations. The closure candidates occur among small- and medium-sized plants and are concentrated among Wool Scouring, Wool Finishers, and Stock and Yarn producers, although other subcategories may be affected as well. The Agency is concerned about the closures. Before promulgating the regulations, EPA intends to further study the conditions that lead to closures. During this assessment, the Agency plans to consider whether alternative levels of control are appropriate for regulating segments of the textile industry. EPA solicits comments that could provide the Agency more understanding of the problems some small- and medium-sized plants face in complying without proposed standards. EPA welcomes suggestions on alternative control technologies that the Agency should consider prior to promulgating these regulations.

(8) EPA has obtained from the industry a substantial data base for the control and treatment technologies which serve as the basis for the proposed regulations. Plants that have not submitted data, or that have compiled more recent data or engineering studies are requested to forward these data to EPA. These data should be individual data points, not averages or other summary data, including flow, production, and all pollutant parameters for which analyses were run. Please submit any qualifications to the data, such as descriptions of facility design, operating procedures, and upset problems during specified periods.

(9) EPA requests that POTWs which receive wastewaters from textile plants submit data which would document the occurrence of interference with collection system and treatment plant operations, permit violations, sludge disposal difficulties, or other incidents attributable to the pollutants contained in POTW's influent.

Dated: October 16, 1979.

Douglas M. Costle,

Administrator.

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

Act—The Clean Water Act.

Agency—The U.S. Environmental Protection Agency.

BAT—The best available technology economically achievable, applicable to effluent limitations to be achieved by July 1, 1984, for industrial discharges to surface waters, as defined by Section 304(b) (2) (B) of the Act.

BCT—The best conventional pollutant control technology, applicable to discharges of conventional pollutants from existing industrial point sources, as defined by Section 304(b) (4) of the Act.

BMP—Best management practices, as defined by Section 304(e) of the Act.

BPT—The best practicable control technology currently available, applicable to effluent limitations to be achieved by July 1, 1977, for industrial discharges to surface waters, as defined by Section 304(b) (1) of the Act.

Classical Pollutants—A general term used to refer to the pollutants of primary concern before the "conventional, nonconventional, and toxic pollutant" designations set forth in the Act as amended.

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).

Conventional Pollutants—Constituents of wastewater as determined by Section 304(a) (4) of the Act, including, but not limited to, pollutants classified as biological oxygen demand, suspended solids, oil and grease, fecal coliform, and pH.

Development Document—Development Document for Proposed Effluent Limitations Guidelines, New Source Performance Standards, and Pretreatment Standards for the Textile Mills Point Source Category, prepared by the Effluent Guidelines Division of EPA.

Direct Discharger—An industrial discharger that introduces wastewater to a receiving body of water or land, with or without treatment by the discharger.

Economic Analysis—Economic Impact Analysis of Proposed Effluent Limitations Guidelines, New Source Performance Standards, and Pretreatment Standards for the Textile Mills Point Source Category, prepared by the Office of Analysis and Evaluation of EPA.

Effluent Limitation—A maximum amount per unit of production (or other unit) of each specific constituent of the effluent that is subject to limitation from an existing point source.

Federal Water Pollution Control Act Amendments of 1972—Pub. L. 92-500, which provides the legal authority for current EPA water pollution abatement projects, regulations, and policies. The Federal Water Pollution Control Act was amended further in 1977 in legislation referred to as The Clean Water Act.

Indicator Pollutants—A group of pollutants, including, but not limited to, BOD5, COD, and TSS, which can serve as a basis for limitations on toxic pollutants, which in themselves are very difficult to monitor and expensive to analyze.

Indirect Discharger—An industrial discharger that introduces waste water to a publicly-owned collection system.

In-plant Control Technologies—Controls or measures applied within the manufacturing process to reduce or eliminate pollutant and hydraulic loadings of raw wastewater. Typical in-plant control measures include chemical substitution, material reclamation, water reuse, water reduction, and process changes.

Internal Subcategorization—Divisions within a subcategory to group facilities that, while producing related products from similar raw materials, have differing raw waste characteristics due to the complexity of manufacturing processes employed.

New Source—Industrial facilities from which there is, or may be, a discharge

of pollutants, and whose construction is begun after the publication of the proposed regulations.

Nonconventional Pollutants—Parameters selected for use in developing effluent limitation guidelines and new source performance standards which have not been previously designated as either conventional pollutants or toxic pollutants.

Non-Water Environmental Quality Impact—Deleterious aspects of control and treatment technologies applicable to point source category wastes, including, but not limited to, air pollution, noise, radiation, sludge and solid waste generation, and energy usage.

NPDES—National Pollutant Discharge Elimination System, a Federal program requiring industry and municipalities to obtain permits to discharge plant effluents to the nations water courses, under Section 402 of the Act.

NSPS—New source performance standards, applicable to industrial facilities whose construction is begun after the publication of the proposed regulations, as defined by Section 306 of the Act.

Performance Standards—A maximum weight discharged per unit of production for each constituent that is subject to limitations. Performance standards are applicable to new sources, as opposed to exisitng sources, which are subject to effluent limitations.

Point Source Category—A collection of industrial sources with similar function or product, established by Section 306(b)(1)(A) of the Federal Water Pollution Control Act, as amended for the purpose of establishing Federal standards for the disposal of wastewater.

Pollutant Loading—Ratio of the total daily mass discharge of a particular pollutant to the total daily wet production of a mill expressd in terms of (kg pollutant)/(kkg wet production).

POTW—Publicly owned treatmnt works, facilities that collect, treat, or otherwise dispose of wastewaters, owned and operated by a village, town, county, authority, or other public agency.

Pretreatment Standard—Industrial wastewater effluent quality required for discharge to a 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 (b) and (c) of the Act.

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

Revised Settlement Agreement—A rewritten form of the Settlement Agreement which described provisions authorizing the exclusion from regulation, in certain instances, of toxic pollutants and industry subcategories.

Settlement Agreement—Agreement entered into by EPA with the Natural Resources Defense Council and other environmental groups and approved by the U.S. District Court for the District of Columbia on June 7, 1976. One of the principal provisions of the Settlement Agreement was to direct EPA to consider an extended list of 65 classes of pollutants in 21 industrial categories, including Textile Mills, in the development of effluent limitations guidelines and new source performance standards.

SIC—Standard Industrial Classification, a numerical categorization scheme used by the U.S. Department of Commerce to denote segments of industry.

Toxic Pollutants—All compounds specifically named or referred to in the Settlement Agreement, as well as recommended specific compounds representative of the nonspecific or ambiguous groups or compounds named in the agreement. This list of pollutants was developed based on the use of criteria such as known occurrence in point source effluents, in the aquatic environment, in fish, in drinking water, and through evaluations of carcinogenicity, other chronic toxicity, bioaccumulation, and persistence.

Water Use—Ratio of the spent water from a manufacturing operation to the total wet production by the mill, expressed in terms of (liters of wastewater/day)/(kilogram of wet production/day).

Appendix B—Toxic Pollutants Detected in Treated Effluent Above the Nominal Detection Limit

acrylonitrile
benzene
1,2,4-trichlorobenzene
2,4,6-trichlorophenol
parachlorometacresol
chloroform
1,2-dichlorobenzene
ethylbenzene
trichlorofluoromethane
naphthalene
N-nitrosodi-n-propylamine
pentachlorophenol
phenol
(a) 4-AAP
(b) GC/MS
bis(2-ethylhexyl) phthalate
tetrachloroethylene
toluene
trichloroethylene
antimony
arsenic
cadmium
chromium
copper
cyanide
lead
mercury
nickel
selenium
silver
zinc

Appendix C—Toxic Pollutants not Detected in Treated Effluents

benzidine
3,3-dichlorobenzidine
methyl bromide
2,4-dinitrophenol
N-nitrosodimethylamine
phenanthrene
carbon tetrachloride
1,1,2-trichloroethane
chloroethane
4-chlorophenyl phenyl ether
dichlorodifluoromethane
isophorone
nitrobenzene
4,6-dinitro-o-cresol
acenaphthylene
aldrin
chlordane
4,4'-DDE
4,4'-DDD
alpha-endosulfan
beta-endosulfan
endosulfan sulfate
endrin
endrin aldehyde
heptachlor
heptaclor epoxide
alpha-BHC
beta-BHC
gamma-BHC (lindane)
delta-BHC
toxaphene
acrolein
hexachloroethane
1,1,2,2-tetrachloroethane
bis (chloromethyl) ether
bis(2-chloroethyl) ether
2-chloroethyl vinyl ether
1,3-dichlorobenzene
1,2-trans-dichloroethylene
1,3-dichloropropylene
2,4-dinitrotoluene
fluoranthene
4-bromophenyl phenyl ether
bis (2-chloroisopropyl) ether
bis (2-chloroethoxy) methane
bromoform
chlorodibromomethane
hexachlorobutadiene
hexachlorocyclopentadiene

di-n-octyl phthalate
1,2-benzanthracene
benzo(a)pyrene
chrysene
1,12-benzoperylene
1,2,5,6-dibenzanthracene
indeno (1,2,3-cd)pyrene
PCB-1242
PCB-1254
PCB-1221
PCB-1232
PCB-1248
PCB-1260
PCB-1016
asbestos
2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD)

Appendix D—Toxic Pollutants Detected at Only One Plant and at Less Than the Nominal Detection Limit in the Treated Effluent

1,2-dichloroethane
1,1-dichloroethane
2-chloronaphthalene
2-chlorophenol
1,1-dichloroethylene
1,2-dichloropropane
2,4-dimethylphenol
2,6-dinitrotoluene
1,2-diphenylhydrazine
Methyl chloride
dichlorobromomethane
2-nitrophenol
4-nitrophenol
3,4-benzofluoranthene
11,12-benzofluoranthene
fluorene
vinyl chloride
dieldrin
4,4'-DDT
beryllium

Appendix E—Toxic Pollutants Detected in Treated Effluents at or Below the Nominal Detection Limit

acenaphthene
chlorobenzene
hexachlorobenzene
1,1,1-trichloroethane
1,4-dichlorobenzene
2,4-dichlorophenol
Methylene chloride
N-nitrosodiphenylamine
butyl benzyl phthalate
di-n-butyl phthalate
diethyl phthalate
dimethyl phthalate
anthracene
pyrene
thallium

It is proposed to amend Title 40 by revising Part 410 to read as follows:

PART 410—TEXTILE MILLS POINT SOURCE CATEGORY

General Provisions

Sec.

Subpart I—Felted Fabric Processing Subcategory

Authority: Sections 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. 816, Pub. L. 92-500; 91 Stat. 1567, Pub. L. 95-217.

General Provisions

§ 410.10 Applicability.

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

§ 410.11 General definitions.

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

"Color" means that color as measured by the modified tristimulus method as developed by the American Dye Manufactures Institute (ADMI) and described in the Proceedings of the 28th Industrial Waste Conference, Purdue University.

Subpart A—Wool Scouring Subcategory

§ 410.20 Applicability; description of the Wool Scouring Subcategory.

The provisions of this subpart are applicable to discharges containing process wastes that enter the waters of the United States, and introductions of pollutants into publicly owned treatment works resulting from facilities that scour natural impurities from raw wool and other animal hair fibers as the majority of their processing. Integrated mills that perform wool scouring and other finishing should apply the applicable wool scouring effluent limitations to the wool scouring production and the other finishing production to applicable effluent limitations covering that production in order to calculate discharge allowances.

§ 410.21 Specialized definitions.

In addition to the definitions set forth in 40 CFR Part 401, the following definition applies to this subpart:

(a) "Raw grease wool" means the raw wool as obtained from the sheep, with all natural and acquired impurities such as grease, soluble salts (suint), and dirt.

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

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 reductions attainable by the application of the best conventional pollutant control technology (BCT):

Subpart A (less than 3,300 kkg/yr total production)

Pollutant or pollutant property	BCT effluent limitations	
	Maximum for any 1 day	Average of daily values for 30 consecutive days
	kg/kkg (or lb/1000 lb) of raw grease wool	
BOD5	10.6	5.3
TSS	32.2	16.1
pH	Within the range of 6.0 to 9.0 at all times	

Subpart A (3,300 kkg/yr total production or greater)

Pollutant or pollutant property	BCT effluent limitations	
	Maximum for any 1 day	Average of daily values for 30 consecutive days
	kg/kkg (or lb/1000 lb) of raw grease wool	
BOD5	1.5	0.9
TSS	10.9	16.3
pH	Within the range of 6.0 to 9.0 at all times	

§ 410.24 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–.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 effluent limitations	
	Maximum for any 1 day	Average of daily values for 30 consecutive days
	kg/kkg (or lb/1000 lb) of raw grease wool	
COD	36.3	24.6
TSS	10.9	6.3
Total Phenol	0.002	0.001
Total Chromium	0.01	0.006
Total Copper	0.01	0.006
Total Zinc	0.02	0.01
Color (ADMI units)	2400	1500

§ 410.25 New source performance standards (NSPS).

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

Subpart A

Pollutant or pollutant property	NSPS effluent limitations	
	Maximum for any 1 day	Average of daily values for 30 consecutive days
	kg/kkg (or lb/1000 lb) of raw grease wool	
BOD5	1.5	0.9
COD	36.3	24.6
TSS	10.9	6.3
Total Phenol	0.002	0.001
Total Chromium	0.01	0.006
Total Copper	0.01	0.006
Total Zinc	0.02	0.01
Color (ADMI units)	2400	1500
pH	Within the range of 6.0 to 9.0 at all times	

§ 410.26 Pretreatment standards for existing sources (PSES).

Except as provided in 40 CFR 403.13, any existing source subject to this subpart that introduces pollutants into a publicly owned treatment works must comply with 40 CFR Part 403 and achieve the following pretreatment standards for existing sources (PSES):

Subpart A

Pollutant or pollutant property	PSES effluent limitations	
	Maximum for any 1 day	Average of daily values for 30 consecutive days
	Milligrams per liter (mg/l)	
Total chromium	0.90	0.50
Total copper	0.90	0.50
Total zinc	1.80	1.00

In cases when POTWs find it necessary to impose mass effluent limitations, the following equivalent mass limitations are provided as guidance:

Subpart A

Pollutant or pollutant property	PSES effluent limitations: Maximum for any 1 day	PSES effluent limitations: Average of daily values for 30 consecutive days
	kg/kkg (or lb/1000 lb) of raw grease wool	
Total chromium	0.01	0.006
Total copper	0.01	0.006
Total zinc	0.02	0.012

§ 410.27 Pretreatment standards for new sources (PSNS).

Any new source subject to this subpart that introduces pollutants into a publicly owned treatment works must comply with 40 CFR Part 403 and achieve the following pretreatment standards for new sources (PSNS):

Subpart A

Pollutant or pollutant property	PSNS effluent limitations: Maximum for any 1 day	PSNS effluent limitations: Average of daily values for 30 consecutive days
	Milligrams per liter (mg/l)	
Total chromium	0.90	0.50
Total copper	0.90	0.50
Total zinc	1.80	1.00

In cases when POTWs find it necessary to impose mass effluent limitations, the following equivalent mass limitations are provided as guidance:

Subpart A

Pollutant or pollutant property	PSNS effluent limitations: Maximum for any 1 day	PSNS effluent limitations: Average of daily values for 30 consecutive days
	kg/kkg (or lb/1000 lb) of raw grease wool	
Total chromium	0.01	0.006
Total copper	0.01	0.006
Total zinc	0.02	0.012

Subpart B—Wool Finishing Subcategory

§ 410.30 Applicability; description of the Wool Finishing Subcategory.

The provisions of this subpart are applicable to discharges containing process wastes that enter the waters of the United States, and introductions of pollutants into publicly owned treatment works resulting from facilities that finish fabric, a majority of which is wool, other animal hair fiber, or blends containing primarily wool or other animal hair fiber, by employing any of the following processing operations on at least five percent of their total production: Carbonizing, fulling, bleaching, scouring (not including raw grease wool scouring), dyeing and/or application of functional finish chemicals. Facilities that primarily finish stock or yarn of wool, other animal hair fiber, or blends containing primarily wool or other animal hair fiber and that perform carbonizing, are included in this subpart. Wool stock or yarn mills that do not perform carbonizing and scouring are covered under Stock & Yarn Finishing. Integrated mills that finish a majority of wool fabric along with greige goods manufacturing or other finishing operations such as yarn dyeing are included in this subpart and total production (excluding weaving and other dry operations) should be applied to the applicable effluent limitations to calculate discharge allowances.

§ 410.31 Specialized definitions.

In addition to the definitions set forth in 40 CFR Part 401, the following definition applies to this subpart:

(a) "Product" means the final material produced or processed by the mill.

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

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 reductions attainable by the application of the best conventional pollutant control technology (BCT):

Subpart B (less than 5,800 kkg/yr total production)

Pollutant or pollutant property	BCT effluent limitations: Maximum for any 1 day	BCT effluent limitations: Average of daily values for 30 consecutive days
	kg/kkg (or lb/1000 lb) of product	
BOD5	22.4	11.2
TSS	35.2	17.6
pH	Within the range of 6.0 to 9.0 at all times	

Subpart B (5,800 kkg/yr total production or greater)

Pollutant or pollutant property	BCT effluent limitations: Maximum for any 1 day	BCT effluent limitations: Average of daily values for 30 consecutive days
	kg/kkg (or lb/1000 lb) of product	
BOD5	15.4	8.9
TSS	11.0	6.4
pH	Within the range of 6.0 to 9.0 at all times	

§ 410.34 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):

Subpart B

Pollutant or pollutant property	BAT effluent limitations: Maximum for any 1 day	BAT effluent limitations: Average of daily values for 30 consecutive days
	kg/kkg (or lb/1000 lb) of product	
COD	82.4	56.2
TSS	11.0	6.4
Total phenol	0.032	0.018
Total chromium	0.26	0.14
Total copper	0.26	0.14
Total zinc	0.52	0.28
Color (ADMI units)	190	120

§ 410.35 New source performance standards (NSPS).

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

Subpart B

Pollutant or pollutant property	NSPS effluent limitations: Maximum for any 1 day	NSPS effluent limitations: Average of daily values for 30 consecutive days
	kg/kkg (or lb/1000 lb) of product	
BOD5	15.4	8.9
COD	82.4	56.2
TSS	11.0	6.4
Total phenol	0.032	0.018
Total chromium	0.26	0.14
Total copper	0.26	0.14
Total zinc	0.52	0.28
Color (ADMI units)	190	120
pH	Within the range of 6.0 to 9.0 at all times	

§ 410.36 Pretreatment standards for existing sources (PSES).

Except as provided in 40 CFR 403.13, any existing source subject to this subpart that introduces pollutants into a publicly owned treatment works must comply with 40 CFR Part 403 and achieve the following pretreatment standards for existing sources (PSES):

Subpart B

Pollutant or pollutant property	PSES effluent limitations: Maximum for any 1 day	PSES effluent limitations: Average of daily values for 30 consecutive days
	Milligrams per liter (mg/l)	
Total chromium	0.90	0.50
Total copper	0.90	0.50
Total zinc	1.80	1.00

In cases when POTWs find it necesary to impose mass effluent limitations, the following equivalent mass limitations are provided as guidance:

Subpart B

Pollutant or pollutant property	PSES effluent limitations: Maximum for any 1 day	PSES effluent limitations: Average of daily values for 30 consecutive days
	kg/kkg (or lb/1000 lb) of product	
Total chromium	0.26	0.14
Total copper	0.26	0.14
Total zinc	0.52	0.28

§ 410.37 Pretreatment standards for new sources (PSNS).

Any new source subject to this subpart that introduces pollutants into a publicly owned treatment works must comply with 40 CFR Part 403 and achieve the following pretreatment standards for new sources (PSNS):

Subpart B

Pollutant or pollutant property	PSNS effluent limitations: Maximum for any 1 day	PSNS effluent limitations: Average of daily values for 30 consecutive days
	Milligrams per liter (mg/l)	
Total chromium	0.90	0.50
Total copper	0.90	0.50
Total zinc	1.80	1.00

In cases when POTWs find it necesary to impose mass effluent limitations, the following equivalent mass limitations are provided as guidance:

Subpart B

Pollutant or pollutant property	PSNS effluent limitations: Maximum for any 1 day	PSNS effluent limitations: Average of daily values for 30 consecutive days
	kg/kkg (or lb/1000 lb) of product	
Total chromium	0.26	0.14
Total copper	0.26	0.14
Total zinc	0.52	0.28

Subpart C—Low Water Use Processing Subcategory

§ 410.40 Applicability; description of the Low Water Use Processing Subcategory.

The provisions of this subpart are applicable to discharges containing process wastes that enter the waters of the United States, and introductions of pollutants into publicly owned treatment works resulting from facilities other than finishing facilities engaged only in manufacturing greige goods, laminating or coating fabrics, texturizing yarn, tufting and backing carpet, producing tire cord fabric, and similar activities in which either cleanup is the primary water use or process water requirements are small, or both.

§ 410.41 Specialized definitions.

In addition to the definitions set forth in 40 CFR Part 401, the following definition applies to this subpart:

(a) "Product" means the final material produced or processed by the mill.

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

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 reductions attainable by the application of the best conventional pollutant control technology (BCT):

Subpart C

Pollutant or pollutant property	BCT effluent limitations: Maximum for any 1 day	BCT effluent limitations: Average of daily values for 30 consecutive days
	kg/kkg (or lb/1000 lb) of product	
BOD5	1.4	0.7
TSS	1.4	0.7
pH	Within the range of 6.0 to 9.0 at all times	

§ 410.45 New source performance standards (NSPS).

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

Subpart C

Pollutant or pollutant property	NSPS effluent limitations: Maximum for any 1 day	NSPS effluent limitations: Average of daily values for 30 consecutive days
	kg/kkg (or lb/1000 lb) of product	
BOD5	1.4	0.7
COD	2.8	1.4
TSS	1.4	0.7
pH	Within the range of 6.0 to 9.0 at all times	

§ 410.46 Pretreatment standards for existing sources (PSES).

Except as provided in 40 CFR 403.13, any existing source subject to this subpart that introduces pollutants into a publicly owned treatment works must comply with 40 CFR Part 403.

§ 410.47 Pretreatment standards for new sources (PSNS).

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

Subpart D—Woven Fabric Finishing Subcategory

§ 410.50 Applicability; description of the Woven Fabric Finishing Subcategory.

The provisions of this subpart are applicable to discharges containing process wastes that enter the waters of the United States, and introductions of pollutants into publicity owned treatment works resulting from facilities that primarily finish fabric, a majority of which is woven, by employing any of the following processing operations on at least five percent of their production: Desizing, scouring, bleaching, mercerizing, dyeing, printing, and/or application of functional finish chemicals. Denim finishing mills are included in this subpart, but facilities finishing woven fabric composed primarily of wool are covered under Wool Finishing. Integrated mills that

finish a majority of woven fabric along with greige goods manufacturing or other finishing operations such as yarn dyeing are included in this subpart and total production (excluding weaving and other dry operations) should be applied to the applicable effluent limitations to calculate discharge allowances.

§ 410.51 Specialized definitions.

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

(a) "Product" means the final material produced or processed by the mill.

(b) "Simple Processing" means the internal subdivision of Woven Fabric Finishing for facilities that perform fiber preparations, desizing, scouring, or functional finishing, and/or one of the following processes applied to more than five percent of total production: bleaching, dyeing, or printing. This subdivision includes all Woven Fabric Finishing facilities that do not qualify under either the Complex Processing or Complex Processing Plus Desizing subdivision.

(c) "Complex Processing" means the internal subdivision of Woven Fabric Finishing for facilities that perform desizing of less than 50 percent of their total production and more than one of the following, each applied to more than five percent of total production: Bleaching, dyeing, or printing. These facilities may also perform fiber preparation, scouring, mercerizing, and functional finishing.

(d) "Complex Processing Plus Desizing" means the internal subdivision of Woven Fabric Finishing for facilities that perform desizing of greater than 50 percent of their total production, and more than one of the following, each applied to more than five percent of total production: Bleaching, dyeing, or printing. These facilities may also perform fiber preparation, scouring, mercerizing, and functional finishing.

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

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 reductions attainable by the application of the best conventional pollutant control technology (BCT):

Subpart D—Simple Processing (less than 13,500 kkg/yr total production)

Pollutant or pollutant property	BCT effluent limitations: Maximum for any 1 day	BCT effluent limitations: Average of daily values for 30 consecutive days
	kg/kkg (or lb/1000 lb) of product	
BOD5	6.6	3.3
TSS	17.8	8.9
pH	Within the range of 6.0 to 9.0 at all times	

Subpart D—Simple Processing (13,500 kkg/yr total production or greater)

Pollutant or pollutant property	BCT effluent limitations: Maximum for any 1 day	BCT effluent limitations: Average of daily values for 30 consecutive days
	kg/kkg (or lb/1000 lb) of product	
BOD5	2.7	1.6
TSS	3.4	2.0
pH	Within the range of 6.0 to 9.0 at all times	

Subpart D—Complex Processing (less than 12,200 kkg/yr total production)

Pollutant or pollutant property	BCT effluent limitations: Maximum for any 1 day	BCT effluent limitations: Average of daily values for 30 consecutive days
	kg/kkg (or lb/1000 lb) of product	
BOD5	6.6	3.3
TSS	17.8	8.9
pH	Within the range of 6.0 to 9.0 at all times	

Subpart D—Complex Processing (12,200 kkg/yr total production or greater)

Pollutant or pollutant property	BCT effluent limitations: Maximum for any 1 day	BCT effluent limitations: Average of daily values for 30 consecutive days
	kg/kkg (or lb/1000 lb) of product	
BOD5	5.0	2.9
TSS	4.7	2.7
pH	Within the range of 6.0 to 9.0 at all times	

Subpart D—Complex Processing Plus Desizing (less than 9,300 kkg/yr total production)

Pollutant or pollutant property	BCT effluent limitations: Maximum for any 1 day	BCT effluent limitations: Average of daily values for 30 consecutive days
	kg/kkg (or lb/1000 lb) of product	
BOD5	6.6	3.3
TSS	17.8	8.9
pH	Within the range of 6.0 to 9.0 at all times	

Subpart D—Complex Processing Plus Desizing (9,300 kkg/yr total production or greater)

Pollutant or pollutant property	BCT effluent limitations: Maximum for any 1 day	BCT effluent limitations: Average of daily values for 30 consecutive days
	kg/kkg (or lb/1000 lb) of product	
BOD5	6.6	3.3
TSS	6.2	3.6
pH	Within the range of 6.0 to 9.0 at all times	

§ 410.54 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):

Subpart D—Simple Processing

Pollutant or pollutant property	BAT effluent limitations: Maximum for any 1 day	BAT effluent limitations: Average of daily values for 30 consecutive days
	kg/kkg (or lb/1000 lb) of product	
COD	33.1	22.6
TSS	3.4	2.0
Total phenol	0.005	0.003
Total chromium	0.07	0.04
Total copper	0.07	0.04
Total zinc	0.14	0.08
Color (ADMI units)	340	220

Subpart D—Complex Processing

Pollutant or pollutant property	BAT effluent limitations: Maximum for any 1 day	BAT effluent limitations: Average of daily values for 30 consecutive days
	kg/kkg (or lb/1000 lb) of product	
COD	38.1	26.0
TSS	4.7	2.7
Total phenol	0.013	0.008
Total chromium	0.08	0.04
Total copper	0.08	0.04
Total zinc	0.16	0.08
Color (ADMI units)	340	220

Subpart D—Complex Processing Plus Desizing

Pollutant or pollutant property	BAT effluent limitations: Maximum for any 1 day	BAT effluent limitations: Average of daily values for 30 consecutive days
	kg/kkg (or lb/1000 lb) of product	
COD	49.9	34.0
TSS	6.2	3.6
Total phenol	0.012	0.007
Total chromium	0.10	0.06
Total copper	0.10	0.06
Total zinc	0.20	0.11
Color (ADMI units)	340	220

§ 410.55 New source performance standards (NSPS).

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

Subpart D—Simple Processing

Pollutant or pollutant property	NSPS effluent limitations: Maximum for any 1 day	NSPS effluent limitations: Average of daily values for 30 consecutive days
	kg/kkg (or lb/1000 lb) of product	
BOD5	1.3	0.74
COD	22.8	15.5
TSS	2.4	1.4
Total phenol	0.003	0.002
Total chromium	0.07	0.04
Total copper	0.07	0.04
Total zinc	0.14	0.08
Color (ADMI units)	190	120
pH	Within the range of 6.0 to 9.0 at all times	

Subpart D—Complex Processing

Pollutant or pollutant property	NSPS effluent limitations: Maximum for any 1 day	NSPS effluent limitations: Average of daily values for 30 consecutive days
	kg/kkg (or lb/1000 lb) of product	
BOD5	2.4	1.4
COD	26.2	17.9
TSS	3.4	2.0
Total phenol	0.008	0.005
Total chromium	0.08	0.04
Total copper	0.08	0.04
Total zinc	0.16	0.08
Color (ADMI units)	190	120
pH	Within the range of 6.0 to 9.0 at all times	

Subpart D—Complex Processing Plus Desizing

Pollutant or pollutant property	NSPS effluent limitations: Maximum for any 1 day	NSPS effluent limitations: Average of daily values for 30 consecutive days
	kg/kkg (or lb/1000 lb) of product	
BOD5	3.1	1.8
COD	34.3	23.4
TSS	4.4	2.6
Total phenol	0.008	0.005
Total chromium	0.10	0.06
Total copper	0.10	0.06
Total zinc	0.20	0.11
Color (ADMI units)	190	120
pH	Within the range of 6.0 to 9.0 at all times	

§ 410.56 Pretreatment standards for existing sources (PSES).

Except as provided in 40 CFR 403.13, any existing source subject to this subpart that introduces pollutants into a publicly owned treatment works must comply with 40 CFR Part 403 and achieve the following pretreatment standards for existing sources (PSES):

Subpart D—Simple Processing

Pollutant or pollutant property	PSES effluent limitations: Maximum for any 1 day	PSES effluent limitations: Average of daily values for 30 consecutive days
	Milligrams per liter (mg/1)	
Total chromium	0.90	0.50
Total copper	0.90	0.50
Total zinc	1.80	1.00

In cases when POTWs find it necessary to impose mass effluent limitations, the following equivalent mass limitations are provided as guidance:

Subpart D—Simple Processing

Pollutant or pollutant property	PSES effluent limitations: Maximum for any 1 day	PSES effluent limitations: Average of daily values for 30 consecutive days
	kg/kkg (or lb/1000 lb) of product	
Total chromium	0.07	0.04
Total copper	0.07	0.04
Total zinc	0.14	0.08

Subpart D—Complex Processing

Pollutant or pollutant property	PSES effluent limitations: Maximum for any 1 day	PSES effluent limitations: Average of daily values for 30 consecutive days
	Milligrams per liter (mg/1)	
Total chromium	0.90	0.50
Total copper	0.90	0.50
Total zinc	1.80	1.00

In cases when POTWs find it necessary to impose mass effluent limitations, the following equivalent mass limitations are provided as guidance:

Subpart D—Complex Processing

Pollutant or pollutant property	PSES effluent limitations: Maximum for any 1 day	PSES effluent limitations: Average of daily values for 30 consecutive days
	kg/kkg (or lb/1000 lb) of product	
Total chromium	0.08	0.04
Total copper	0.08	0.04
Total zinc	0.16	0.08

Subpart D—Complex Processing Plus Desizing

Pollutant or pollutant property	PSES effluent limitations: Maximum for any 1 day	PSES effluent limitations: Average of daily values for 30 consecutive days
	Milligrams per liter (mg/1)	
Total chromium	0.90	0.50
Total copper	0.90	0.50
Total zinc	1.80	1.00

In cases when POTWs find it necessary to impose mass effluent limitations, the following equivalent mass limitations are provided as guidance:

Subpart D—Complex Processing Plus Desizing

Pollutant or pollutant property	PSES effluent limitations: Maximum for any 1 day	PSES effluent limitations: Average of daily values for 30 consecutive days
	kg/kkg (or lb/1000 lb) of product	
Total chromium	0.10	0.06
Total copper	0.10	0.06
Total zinc	0.20	0.11

§ 410.57 Pretreatment standards for new sources (PSNS).

Any new source subject to this subpart that introduces pollutants into a publicly owned treatment works must comply with 40 CFR Part 403 and achieve the following pretreatment standards for new sources (PSNS):

Subpart D—Simple Processing

Pollutant or pollutant property	PSNS effluent limitations: Maximum for any 1 day	PSNS effluent limitations: Average of daily values for 30 consecutive days
	Milligrams per liter (mg/1)	
Total chromium	0.90	0.50
Total copper	0.90	0.50
Total zinc	0.80	1.00

In cases when POTWs find it necessary to impose mass effluent limitations, the following equivalent mass limitations are provided as guidance:

Subpart D—Simple Processing

Pollutant or pollutant property	PSNS effluent limitations: Maximum for any 1 day	PSNS effluent limitations: Average of daily values for 30 consecutive days
	kg/kkg (or lb/1000 lb) of product	
Total chromium	0.07	0.04
Total copper	0.07	0.04
Total zinc	0.14	0.08

Subpart D—Complex Processing

Pollutant or pollutant property	PSNS effluent limitations: Maximum for any 1 day	PSNS effluent limitations: Average of daily values for 30 consecutive days
	Milligrams per liter (mg/1)	
Total chromium	0.90	0.50
Total copper	0.90	0.50
Total zinc	1.60	1.00

In cases when POTWs find it necessary to impose mass effluent limitations, the following equivalent mass limitations are provided as guidance.

Subpart D—Complex Processing

Pollutant or pollutant property	PSNS effluent limitations: Maximum for any 1 day	PSNS effluent limitations: Average of daily values for 30 consecutive days
	kg/kkg (or lb/1000 lb) of product	
Total chromium	0.08	0.04
Total copper	0.08	0.04
Total zinc	0.16	0.08

Subpart D—Complex Processing Plus Desizing

Pollutant or Pollutant property	PSNS effluent limitations: Maximum for any 1 day	PSNS effluent limitations: Average of daily values for 30 consecutive days
	Milligrams per liter (mg/1)	
Total chromium	0.90	0.50
Total copper	0.90	0.50
Total zinc	1.60	1.00

In cases when POTWs find it necessary to impose mass effluent limitations, the following equivalent mass limitations are provided as guidance:

Subpart D—Complex Processing Plus Desizing

Pollutant or Pollutant property	PSNS effluent limitations: Maximum for any 1 day	PSNS effluent limitations: Average of daily values for 30 consecutive days
	kg/kkg (as lb/1000 lb) of product	
Total chromium	0.10	0.06
Total copper	0.10	0.06
Total zinc	0.20	0.11

Subpart E—Knit Fabric Finishing Subcategory

§ 410.60 Applicability; description of the Knit Fabric Finishing Subcategory.

The provisions of this subpart are applicable to discharges containing process wastes that enter the waters of the United States, and introductions of pollutants into publicly owned treatment works resulting from facilities that primarily finish fabric made of cotton and/or synthetic fiber, a majority of which is knit, by employing any of the following processing operations on at least five percent of their production: Scouring, bleaching, dyeing, printing, and/or application of lubricants, antistatic agents, and functional finish chemicals. Integrated mills that finish a majority of knit fabric along with greige goods manufacturing or other finishing operations such as yarn dyeing are included in this subpart and total production (excluding knitting and other dry operations) should be applied to the applicable effluent limitations to calculate discharge allowances.

§ 410.61 Specialized definitions.

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

(a) "Product" means the final material produced or processed by the mill.

(b) "Simple Processing" means the internal subdivision of Knit Fabric Finishing for facilities that perform fiber preparation, scouring, or functional finishing, and/or one of the following processes applied to more than five percent of total production: Bleaching, dyeing, or printing. This subdivision includes all Knit Fabric Finishing facilities that do not qualify under either the Complex Processing or Hosiery Products subdivision.

(c) "Complex Processing" means the internal subdivision of Knit Fabric Finishing for facilities that perform more than one of the following processes each applied to more than five percent of total production: Bleaching, dyeing, or printing. These facilities may also perform fiber preparation, scouring, mercerizing, and functional finishing.

(d) "Hosiery Products" means the internal subdivision of Knit Fabric Finishing for facilities that are engaged primarily in dyeing or finishing hosiery of any type.

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

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 degreee of effluent reductions attainable by the applications of the best conventional pollutant control technology (BCT):

Subpart E—Simple Processing (less than 7,200 kkg/yr total production)

Pollutant or Pollutant Property	BCT effluent limitations: Maximum for any 1 day	BCT effluent limitations: Average of daily values for 30 consecutive days
	Kg/kkg (or lb/1000 lb) of product	
BOD5	5.0	2.5
TSS	21.8	10.9
pH	Within the range of 6.0 to 9.0 at all times	

Subpart E—Simple Processing (7,200 kkg/yr total production or greater)

Pollutant or pollutant property	BCT effluent limitations: Maximum for any 1 day	BCT effluent limitations: Average of daily values for 30 consecutive days
	kg/kkg (or lb/1000 lb) of product	
BOD5	4.7	2.5
TSS	5.2	3.0
pH	Within the range of 6.0 to 9.0 at all times	

Subpart E—Complex Processing (less than 11,700 kkg/yr total production

Pollutant or pollutant property	BCT effluent limitations: Maximum for any 1 day	BCT effluent limitations: Average of daily values for 30 consecutive days
	kg/kkg (or lb/1000 lb) of product	
BOD 5	5.0	2.5
TSS	21.8	10.9
pH	Within the range of 6.0 to 9.0 at all times	

Subpart E—Complex Processing (11,700 kkg/yr total production or greater)

Pollutant or pollutant property	BCT effluent limitations: Maximum for any 1 day	BCT effluent limitations: Average of daily values for 30 consecutive days
	kg/kkg (or lb/1000 lb) of product	
BOD 5	3.9	2.3
TSS	5.0	2.9
pH	Within the range of 6.0 to 9.0 at all times	

Subpart E—Hosiery Products (less than 14,100 kkg/yr total production)

Pollutant or pollutant property	BCT effluent limitations: Maximum for any 1 day	BCT effluent limitations: Average of daily values for 30 consecutive days
	kg/kkg (or lb/1000 lb) of product	
BOD 5	15.0	8.7
TSS	28.0	16.0
pH	Within the range of 6.0 to 9.0 at all times	

Subpart E—Hosiery Products (14,100 kkg/yr total production or greater

Pollutant or pollutant property	BCT effluent limitations: Maximum for any 1 day	BCT effluent limitations: Average of daily values for 30 consecutive days
	kg/kkg (or lb/1000 lb) of product	
BOD 5	5.3	3.1
TSS	7.0	4.0
pH	Within the range of 6.0 to 9.0 at all times	

§ 410.64 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):

Subpart E—Simple Processing

Pollutant or pollutant property	BAT effluent limitations: Maximum for any 1 day	BAT effluent limitations: Average of daily values for 30 consecutive days
	kg/kkg (or lb/1000 lb) of product	
COD	64.6	44.0
TSS	5.2	3.0
Total phenol	0.018	0.010
Total chromium	0.12	0.07
Total copper	0.12	0.07
Total zinc	0.24	0.14
Color (ADMI units)	340	220

Subpart E—Complex Processing

Pollutant or pollutant property	BAT effluent limitations: Maximum for any 1 day	BAT effluent limitations: Average of daily values for 30 consecutive days
	kg/kkg (or lb/1000 lb) of product	
COD	41.1	28.0
TSS	5.0	2.9
Total phenol	0.011	0.006
Total chromium	0.08	0.04
Total copper	0.08	0.04
Total zinc	0.15	0.08
Color (ADMI units)	340	220

Subpart E—Hosiery Products

Pollutant or pollutant property	BAT effluent limitations: Maximum for any 1 day	BAT effluent limitations: Average of daily values for 30 consecutive days
	kg/kkg (or lb/1000 lb) of product	
COD	47.7	32.5
TSS	7.0	4.0
Total phenol	0.006	0.003
Total chromium	0.06	0.03
Total copper	0.06	0.03
Total zinc	0.12	0.07
Color (ADMI units)	190	120

§ 410.65 New source performance standards (NSPS).

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

Subpart E—Simple Processing

Pollutant or pollutant property	NSPS effluent limitations: Maximum for any 1 day	NSPS effluent limitations: Average of daily values for 30 consecutive days
	kg/kkg (or lb/1000 lb) of product	
BOD5	2.2	1.3
COD	44.4	30.3
TSS	3.7	2.1
Total phenol	0.011	0.007
Total chromium	0.12	0.07
Total copper	0.12	0.07
Total zinc	0.24	0.14
Color (ADMI units)	190	120
pH	Within the range of 6.0 to 9.0 at all times	

Subpart E—Complex Processing

Pollutant or pollutant property	NSPS effluent limitations: Maximum for any 1 day	NSPS effluent limitations: Average of daily values for 30 consecutive days
	kg/kkg (or lb/1000 lb) of product	
BOD5	1.8	1.1
COD	28.3	19.3
TSS	3.6	2.1
Total phenol	0.007	0.004
Total chromium	0.08	0.04
Total copper	0.08	0.04
Total zinc	0.15	0.08
Color (ADMI units)	190	120
pH	Within the range of 6.0 to 9.0 at all times	

Subpart E—Hosiery Products

Pollutant or pollutant property	NSPS effluent limitations: Maximum for any 1 day	NSPS effluent limitations: Average of daily values for 30 consecutive days
	kg/kkg (or lb/1000 lb) of product	
BOD5	5.3	3.1
COD	47.7	32.5
TSS	7.0	4.0
Total phenol	0.006	0.003
Total chromium	0.06	0.003
Total copper	0.06	0.03
Total zinc	0.12	0.07
Color (ADMI units)	190	120
pH	Within the range of 6.0 to 9.0 at all times	

§ 410.66 Pretreatment standards for existing sources (PSES).

Except as provided in 40 CFR 403.13, any existing source subject to this subpart that introduces pollutants into a publicly owned treatment works must comply with 40 CFR Part 403 and achieve the following pretreatment standards for existing sources (PSES):

Subpart E—Simple Processing

Pollutant or pollutant property	PSES effluent limitations: Maximum for any 1 day	PSES effluent limitations: Average of daily values for 30 consecutive days
	Milligrams per liter (mg/l)	
Total chromium	0.90	0.50
Total copper	0.90	0.50
Total zinc	1.80	1.00

In cases when POTWs find it necessary to impose mass effluent limitations, the following equivalent mass limitations are provided as guidance:

Subpart E—/Simple Processing

Pollutant or pollutant property	PSES effluent limitations: Maximum for any 1 day	PSES effluent limitations: Average of daily values for 30 consecutive days
	kg/kkg (or lb/1000 lb) of product	
Total chromium	0.12	0.07
Total copper	0.12	0.07
Total zinc	0.24	0.14

Subpart E—Complex Processing

Pollutant or pollutant property	PSES effluent limitations: Maximum for any 1 day	PSES effluent limitations: Average of daily values for 30 consecutive days
	Milligrams per liter (mg/l)	
Total chromium	0.90	0.50
Total copper	0.90	0.50
Total zinc	1.80	1.00

In cases when POTWs find it necessary to impose mass effluent limitations, the following equivalent mass limitations are provided as guidance:

Subpart E—Complex Processing

Pollutant or pollutant property	PSES effluent limitations: Maximum for any 1 day	PSES effluent limitations: Average of daily values for 30 consecutive days
	kg/kkg (or lb/1000 lb) of product	
Total chromium	0.08	0.04
Total copper	0.08	0.04
Total zinc	0.15	0.08

Subpart E—Hosiery Products

Pollutant or pollutant property	PSES effluent limitations: Maximum for any 1 day	PSES effluent limitations: Average of daily values for 30 consecutive days
	Milligrams per liter (mg/l)	
Total chromium	0.90	0.50
Total copper	0.90	0.50
Total zinc	1.80	1.00

In cases when POTWs find it necessary to impose mass effluent limitations, the following equivalent mass limitations are provided as guidance:

Subpart E—Hosiery Products

Pollutant or pollutant property	PSES effluent limitations: Maximum for any 1 day	PSES effluent limitations: Average of daily values for 30 consecutive days
	kg/kkg (or lb/1000 lb) of product	
Total chromium	0.06	0.03
Total copper	0.06	0.03
Total zinc	0.12	0.07

§ 410.67 Pretreatment standards for new sources (PSNS).

Any new source subject to this subpart that introduces pollutants into a publicly owned treatment works must comply with 40 CFR Part 403 and achieve the following pretreatment standards for new sources (PSNS):

Subpart E—Simple Processing

Pollutant or Pollutant property	PSNS effluent limitations: Maximum for any 1 day	PSNS effluent limitations: Average of daily values for 30 consecutive days
	Milligrams per liter (mg/l)	
Total chromium	0.90	0.50
Total copper	0.90	0.50
Total zinc	1.80	1.00

In cases when POTWs find it necessary to impose mass effluent limitations, the following equivalent mass limitations are provided as guidance:

Subpart E—Simple Processing

Pollutant or Pollutant property	PSNS effluent limitations: Maximum for any 1 day	PSNS effluent limitations: Average of daily values for 30 consecutive days
	kg/kkg (as lb/1000 lb) of product	
Total chromium	0.12	0.07
Total copper	0.12	0.07
Total zinc	0.24	0.14

Subpart E—Complex Processing

Pollutant or Pollutant property	PSNS effluent limitations: Maximum for any 1 day	PSNS effluent limitations: Average of daily values for 30 consecutive days
	Milligrams per liter (mg/l)	
Total chromium	0.90	0.50
Total copper	0.90	0.50
Total zinc	1.80	1.00

In cases when POTWs find it necessary to impose mass effluent limitations, the following equivalent mass limitations are provided a guidance:

Subpart E—Complex Processing

Pollutant or Pollutant property	PSNS effluent limitations: Maximum for any 1 day	PSNS effluent limitations: Average of daily values for 30 consecutive days
	kg/kkg (or lb/1000 lb) of product	
Total chromium	0.08	0.04
Total copper	0.08	0.04

Subpart E—Complex Processing

Pollutant or Pollutant property	PSNS effluent limitations: Maximum for any 1 day	PSNS effluent limitations: Average of daily values for 30 consecutive days
	kg/kkg (or lb/1000 lb) of product	
Total zinc	0.15	0.08

Subpart E—Hosiery Products

Pollutant or Pollutant property	PSNS effluent limitations: Maximum for any 1 day	PSNS effluent limitations: Average of daily values for 30 consecutive days
	Milligrams per liter (mg/l)	
Total chromium	0.90	0.50
Total copper	0.90	0.50
Total zinc	1.80	1.00

In cases when POTWs find it necessary to impose mass effluent limitations, the following equivalent mass limitations are provided a guidance:

Subpart E—Hosiery Products

Pollutant or Pollutant property	PSNS effluent limitations: Maximum for any 1 day	PSNS effluent limitations: Average of daily values for 30 consecutive days
	kg/kkg (or lb/1000 lb) of product	
Total chromium	0.06	0.03
Total copper	0.06	0.03
Total zinc	0.12	0.07

Subpart F—Carpet Finishing Subcategory

§ 410.70 Applicability; description of the Carpet Finishing Subcategory.

The provisions of this subpart are applicable to discharges containing process wastes that enter the waters of the United States, and introductions of pollutants into publicly owned treatment works resulting from facilities that primarily finish textile-based floor covering products, of which carpet is the primary element, by employing any of the following processing operations on at least five percent of their production: Scouring, bleaching, dyeing, printing, and/or application of functional finish chemicals. Facilities that only perform carpet tufting and/or backing are covered under Low Water Use Processing. Integrated mills that finish a majority of carpet along with tufting or backing operations or other finishing

operations such as yarn dyeing are included in this subpart and total production (excluding tufting, other dry processing, or backing, should be applied to the applicable effluent limitations to calculate discharge allowances.

§ 410.71 Specialized definitions.

In addition to the definitions set forth in 40 CFR Part 401, the following definition applies to this subpart:

(a) "Product" means the final carpet produced or processed including the primary backing but excluding the secondary backing.

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

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 reductions attainable by the application of the best conventional pollutant control technology (BCT):

Subpart F (less than 9,500 kkg/yr total production)

Pollutant or pollutant property	BCT effluent limitations: Maximum for any 1 day	BCT effluent limitations: Average of daily values for 30 consecutive days
	kg/kkg (or lb/1000 lb) of product	
BOD5	7.8	3.9
TSS	11.0	5.5
pH	Within the range of 6.0 to 9.0 at all times	

Subpart F (9,500 kkg/yr total production or greater)

Pollutant or pollutant property	BCT effluent limitations: Maximum for any 1 day	BCT effluent limitations: Average of daily values for 30 consecutive days
	kg/kkg (or lb/1000 lb) of product	
BOD5	3.8	2.2
TSS	3.0	1.8
pH	Within the range of 6.0 to 9.0 at all times	

§ 410.74 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).

Subpart F

Pollutant or pollutant property	BAT effluent limitations: Maximum for any 1 day	BAT effluent limitations: Average of daily values for 30 consecutive days
	kg/kkg (or lb/1000 lb) of product	
COD5	23.8	16.3
TSS	3.0	1.8
Total phenol	0.010	0.006
Total chromium	0.04	0.02
Total copper	0.04	0.02
Total zinc	0.08	0.05
Color (ADMI units)	340	220

§ 410.75 New source performance standards (NSPS).

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

Subpart F

Pollutant or pollutant property	NSPS effluent limitations: Maximum for any 1 day	NSPS effluent limitations: Average of daily values for 30 consecutive days
	kg/kkg (or lb/1000 lb) of product	
BOD5	1.8	1.0
COD	16.4	11.2
TSS	2.2	1.3
Total phenol	0.007	0.004
Total chromium	0.04	0.02
Total copper	0.04	0.02
Total zinc	0.08	0.05
Color (ADMI units)	190	120
pH	Within the range of 6.0 to 9.0 at all times	

§ 410.76 Pretreatment standards for existing sources (PSES).

Except as provided in 40 CFR 403.13, any existing source subject to this subpart that introduces pollutants into a publicly owned treatment works must comply with 40 CFR Part 403 and achieve the following pretreatment standards for existing sources (PSES):

Subpart F

Pollutant or pollutant property	PSES effluent limitations: Maximum for any 1 day	PSES effluent limitations: Average of daily values for 30 consecutive days
	Milligrams per liter (mg/l)	
Total chromium	0.90	0.50
Total copper	0.90	0.50
Total zinc	1.80	1.00

In cases when POTWs find it necessary to impose mass effluent limitations the following equivalent mass limitations are provided as guidance:

Subpart F

Pollutant or pollutant property	PSES effluent limitations: Maximum for any 1 day	PSES effluent limitations: Average of daily values for 30 consecutive days
	kb/kkg (or lb/1000 lb) of product	
Total chromium	0.04	0.02
Total copper	0.04	0.02
Total zinc	0.08	0.05

§ 410.77 Pretreatment standards for new sources (PSNS).

Any new source subject to this subpart that introduces pollutants into a publicly owned treatment works must comply with 40 CFR Part 403 and achieve the following pretreatment standards for new sources (PSNS):

Subpart F

Pollutant or pollutant property	PSES effluent limitations: Maximum for any 1 day	PSES effluent limitations: Average of daily values for 30 consecutive days
	Milligrams per liter (mg/l)	
Total chromium	0.90	0.50
Total copper	0.90	0.50
Total zinc	1.80	1.00

In cases when POTWs find it necessary to impose mass effluent limitations the following equivalent mass limitations are provided as guidance:

Subpart F

Pollutant or pollutant property	PSNS effluent limitations: Maximum for any 1 day	PSNS effluent limitations: Average of daily values for 30 consecutive days
	kg/kkf (or lb/1000 lb) of product	
Total chromium	0.04	0.02
Total copper	0.04	0.02
Total zinc	1.08	0.05

Subpart G—Stock and yarn Finishing Subcategory

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

The provisions of this subpart are applicable to discharges containing process wastes that enter the waters of the United States, and introductions of pollutants into publicly owned treatment works resulting from facilities that primarily finish stock, yarn, or thread of cotton and/or synthetic fiber by employing any of the following processing operations on at least five percent of their production: Scouring, bleaching, mercerizing, dyeing, and/or

application of functional finish chemicals. Facilities finishing stock, yarn, or thread principally of wool also are covered by this subpart if they do not perform carbonizing as needed for coverage under Wool Finishing. Integrated mills that finish a majority of stock and yarn along with greige goods manufacturing or other finishing operations are included in this subpart and total production (excluding knitting, weaving, or other dry operations) should be applied to the applicable effluent limitations to calculate discharge allowances.

§ 410.81 Specialized definitions.

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

(a) "Product" means the final material produced or processed by the mill.

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

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 reductions attainable by the application of the best conventional pollutant control technology (BCT):

Subpart G (less than 16,400 kkg/yr total production)

Pollutant or pollutant property	BCT effluent limitations: Maximum for any 1 day	BCT effluent limitations: Average of daily values for 30 consecutive days
	kg/kkg (or lb/1000 lb) of product	
BOD5	6.8	3.4
TSS	17.4	8.7
pH	Within the range of 6.0 to 9.0 at all times	

Subpart G (16,400 kkg/yr total production or greater)

Pollutant or pollutant property	BCT effluent limitations: Maximum for any 1 day	BCT effluent limitations: Average of daily values for 30 consecutive days
	kg/kkg (or lb/1000 lb) of product	
BOD5	2.3	1.4
TSS	2.7	1.6
pH	Within the range of 6.0 to 9.0 at all times	

§ 410.84 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):

Subpart G

Pollutant or pollutant property	BAT effluent limitations: Maximum for any 1 day	BAT effluent limitations: Average of daily values for 30 consecutive days
	kg/kkg (or lb/1000 lb) of product	
COD	24.7	16.8
TSS	2.7	1.6
Total Phenol	0.013	0.008
Total chromium	0.09	0.05
Total copper	0.09	0.05
Total zinc	0.18	0.10
Color (ADMI units)	340	220

§ 410.85 New source performance standards (NSPS).

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

Subpart G

Pollutant or pollutant property	NSPS effluent limitations: Maximum for any 1 day	NSPS effluent limitations: Average of daily values for 30 consecutive days
	kg/kkg (or lb/1000 lb) of product	
BOD5	1.1	0.63
COD	17.0	11.5
TSS	1.9	1.1
Total phenol	0.008	0.005
Total chromium	0.09	0.05
Total copper	0.09	0.05
Total zinc	0.18	0.10
Color (ADMI units)	190	120
pH	Within the range of 6.0 to 9.0 at all times	

§ 410.86 Pretreatment standards for existing sources (PSES).

Except as provided in 40 CFR 403.13, any existing source subject to this subpart that introduces pollutants into a publicly owned treatment works must comply with 40 CFR part 403 and achieve the following pretreatment standards for existing sources (PSES):

Subpart G

Pollutant or pollutant property	PSES effluent limitations: Maximum for any 1 day	PSES effluent limitations: Average of daily values for 30 consecutive days
	Milligrams per liter (mg/l)	
Total chromium	0.90	0.50
Total copper	0.90	0.50
Total zinc	1.80	1.00

In cases when POTWs find it necessary to impose mass effluent limitations, the following equivalent mass limitations are provided as guidance:

Subpart G

Pollutant or pollutant property	PSES effluent limitations: Maximum for any 1 day	PSES effluent limitations: Average of daily values for 30 consecutive days
	kg/kkg (or lb/1000 lb) of product	
Total chromium	0.09	0.05
Total copper	0.09	0.05
Total zinc	0.18	0.10

§ 410.87 Pretreatment standards for new sources (PSNS).

Any new source subject to this subpart that introduces pollutants into a publicly owned treatment works must comply with 40 CFR Part 403 and achieve the following pretreatment standards for new sources (PSNS):

Subpart G

Pollutant or pollutant property	PSNS effluent limitations: Maximum for any 1 day	PSNS effluent limitations: Average of daily values for 30 consecutive days
	Milligrams per liter (mg/l)	
Total chromium	0.90	0.50
Total copper	0.90	0.50
Total zinc	1.80	1.00

In cases when POTWs find it necessary to impose mass effluent limitations, the following equivalent mass limitations are provided as guidance:

Subpart G

Pollutant or pollutant property	PSNS effluent limitations: Maximum for any 1 day	PSNS effluent limitations: Average of daily values for 30 consecutive days
	kg/kkg (or lb/1000 lb) of product	
Total chromium	0.09	0.05
Total copper	0.09	0.05
Total zinc	0.18	0.10

Subpart H—Nonwoven manufacturing Subcategory

§ 410.90 Applicability; description of the nonwoven manufacturing subcategory.

The provisions of this subpart are applicable to discharges containing process wastes that enter the waters of the United States, and introductions of pollutants into publicly owned treatment works 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 Felted Fabric Processing. Integrated mills that manufacture a majority of nonwoven textile products along with greige goods manufacturing or other finishing operations are included in this subpart and total production (excluding dry web formation, knitting, weaving, or other dry operations) should be applied to the applicable effluent limitations to calculated discharge allowances.

§ 410.91 Specialized definitions.

In addition to the definitions set forth in 40 CFR Part 401, the following definition applies to this subpart:

(a) "Product" means the final material produced or processed by the mill.

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

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 reductions attainable by the application of the best conventional pollutant control technology (BCT):

Subpart H (less than 28,300 kkg/yr total production)

Pollutant or pollutant property	BCT effluent limitations: Maximum for any 1 day	BCT effluent limitations: Average of daily values for 30 consecutive days
	kg/kkg (or lb/1000 lb) of product	
BOD5	4.3	2.5
TSS	9.3	5.4
pH	Within the range of 6.0 to 9.0 at all times	

Subpart H (28,300 kkg/yr total production or greater)

Pollutant or pollutant property	BCT effluent limitations: Maximum for any 1 day	BCT effluent limitations: Average of daily values for 30 consecutive days
	kg/kkg (or lb/1000 lb) of product	
BOD5	3.3	1.9
TSS	3.3	1.9
pH	Within the range of 6.0 to 9.0 at all times.	

§ 410.94 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):

Subpart H

Pollutant or pollutant property	Bat effluent limitations: Maximum for any 1 day	Bat effluent limitations: Average of daily values for 30 consecutive days
	kg/kkg (or lb/1000 lb) of product	
COD	39.8	27.1
TSS	3.3	1.9
Total phenol	0.002	0.001
Total chromium	0.04	0.02
Total copper	0.04	0.02
Total zinc	0.07	0.04
Color (ADMI units)	340	220

§ 410.95 New source performance standards (NSPS).

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

Subpart H

Pollutant or pollutant property	NSPS effluent limitations: Maximum any 1 day	NSPS effluent limitations: Average of daily values for 30 consecutive days
	kg/kkg (or lb/1000 lb) of product	
BOD5	1.5	0.88
COD	27.3	18.6
TSS	2.3	1.4
Total phenol	0.001	0.006
Total chromium	0.04	0.02
Total copper	0.04	0.02
Total zinc	0.07	0.04
Color (ADMI units)	190	120
pH	Within the range of 6.0 to 9.0 at all times	

§ 410.96 Pretreatment standards for existing sources (PSES).

Except as provided in 40 CFR 403.13, any existing source subject to this subpart that introduces pollutants into a publicly owned treatment works must comply with 40 CFR Part 403 and achieve the following pretreatment standards for existing sources (PSES):

Subpart H

Pollutant or pollutant property	PSES effluent limitations: Maximum for any 1 day	PSES effluent limitations: Average of daily values for 30 consecutive days
	Milligrams per liter (mg/1)	
Total chromium	0.90	0.50
Total copper	0.90	0.50
Total zinc	1.80	1.00

In cases when POTWs find it necessary to impose mass effluent limitations, the following equivalent mass limitations are provided as guidance:

Subpart H

Pollutant or pollutant property	PSES effluent limitations: Maximum for any 1 day	PSES effluent limitations: Average of daily value for 30 consecutive days
	kg/kkg (or lb/1000 lb) of product	
Total chromium	0.04	0.02
Total copper	0.04	0.02
Total zinc	0.07	0.04

§ 410.97 Pretreatment standards for new sources (PSNS).

Any new source subject to this subpart that introduces pollutants into a publicly owned treatment works must comply with 40 CFR Part 403 and achieve the following pretreatment standards for new sources (PSNS):

Subpart H

Pollutant of pollutant property	PSNS effluent limitations: Maximum for any 1 day	PSNS effluent limitations: Average of daily values for 30 consecutive days
	Milligrams per liter (mg/1)	
Total chromium	0.90	0.50
Total copper	0.90	0.50
Total zinc	1.80	1.00

In cases when POTWs find it necessary to impose mass effluent limitations, the following equivalent mass limitations are provided as guidance:

Subpart H

Pollutant or pollutant property	PSNS effluent limitations: Maximum for any 1 day	PSNS effluent limitations: Average of daily values of 30 consecutive days
	kg/kkg (or lb/1000 lb) of product	
Total chromium	0.04	0.02
Total copper	0.04	0.02
Total zinc	0.07	0.04

Subpart I—Felted Fabric Processing Subcategory

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

The provisions of this subpart are applicable to discharges containing process wastes that enter the waters of th United States, and introductions of pollutants into publicly owned treatment works resulting form facilities that primarily manufacture nonwoven products by employing fulling and felting operations as a means of achieving fiber bonding. Integrated mills that process a majority of felted fabric along with greige goods manufacturing

or other finishing operations are included in this subpart and total production (excluding knitting, weaving, or other dry operations) should be applied to the applicable effluent limitations to calculate discharge allowances.

§ 410.101 Specialized definitions.

In addition to the definitions set forth in 40 CFR Part 401, the following definition applies to this subpart:

(a) "Product" means the final material produced or processed by the mill.

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

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 reductions attainable by the application of the best conventional pollutant control technology (BCT):

Subpart I		
	BCT effluent limitations	
Pollutant or pollutant property	Maximum for any 1 day	Average of daily values for 30 consecutive days
	kg/kkg (or lb/1000 lb) of product	
BOD 5	23.1	13.4
TSS	62.0	36.0
pH	Within the range of 6.0 to 9.0 at all times	

§ 410.104 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):

Subpart I		
	BAT effluent limitations	
Pollutant or pollutant property	Maximum for any 1 day	Average of daily values for 30 consecutive days
	kg/kkg (or lb/1000 lb) of product	
COD	143.0	97.0
TSS	62.0	36.0
Total phenol	0.05	0.03
Total chromium	0.19	0.11
Total copper	0.19	0.11
Total zinc	0.38	0.21
Color (ADMI units)	380	240

§ 410.1095 New source performance standards (NSPS).

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

Subpart I		
	NSPS effluent limitations	
Pollutant or pollutant property	Maximum for any 1 day	Average of daily values for 30 consecutive days
	kg/kkg (or lb/1000 lb) of product	
BOD5	8.1	4.7
COD	78.5	53.5
TTS	15.7	9.1
Total phenol	0.024	0.014
Total chromium	0.19	0.11
Total copper	0.19	0.11
Total zinc	0.38	0.21
Color (ADMI units)	190	120
pH	Within the range of 6.0 to 9.0 at all times	

§ 410.106 Pretreatment standards for existing sources (PSES).

Except as provided in 40 CFR 403.13, any existing source subject to this subpart that introduces pollutants into a publicly owned treatment works must comply with 40 CFR Part 403 and achieve the following pretreatment standards for existing sources (PSES):

Subpart I		
	PSES effluent limitations	
Pollutant or pollutant property	Maximum for any 1 day	Average of daily values for 30 consecutive days
	Milligrams per liter (mg/l)	
Total chromium	0.90	0.50
Total copper	0.90	0.50
Total zinc	1.80	1.00

In cases when POTWs find it necessary to impose mass effluent limitations, the following equivalent mass limitations are provided as guidance:

Subpart I		
	PSES effluent limitations	
Pollutant or pollutant property	Maximum for any 1 day	Average of daily values for 30 consecutive days
	kg/kkg (or lb/1000 lb) of product	
Total chromium	0.19	0.11
Total copper	0.19	0.11
Total zinc	0.38	0.21

§ 410.107 Pretreatment standards for new sources (PSNS).

Any new source subject to this subpart that introduces pollutants into a publicly owned treatment works must comply with 40 CFR Part 403 and achieve the following pretreatment standards for new sources (PSNS):

Subpart I		
	PSNS effluent limitations	
Pollutant or pollutant property	Maximum for any 1 day	Average of daily values for 30 consecutive days
	Milligrams per liter (mg/l)	
Total chromium	0.90	0.50
Total copper	0.90	0.50
Total zinc	1.80	1.00

In cases when POTWs find it necessary to impose mass effluent limitations, the following equivalent mass limitations are provided as guidance:

Subpart I		
	PSNS effluent limitations	
Pollutant or pollutant property	Maximum for any 1 day	Average of daily values for 30 consecutive days
	kg/kkg (or lb/1000 lb) of product	
Total chromium	0.19	0.11
Total copper	0.19	0.11
Total zinc	0.38	0.21

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