ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 469

[WH-FRL 2327-8]

Electrical and Electronic Components Point Source Category Effluent Limitations Guidelines, Pretreatment Standards, and New Source Performance Standards

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: This regulation limits the discharge of pollutants into navigable waters and publicly owned treatment works (POTWs) from semiconductor and electronic crystal manufacturing facilities. The Clean Water Act and a Settlement Agreement require EPA to issue this regulation.

The purpose of this regulation is to provide effluent limitations for "best practicable technology" (BPT) "best available technology" (BAT), "best conventional technology" (BCT) and "new source performance standards" (NSPS) for direct dischargers and pretreatment standards for new and existing indirect dischargers.

DATES: In accordance with 40 CFR 100.01 (45 FR 26048), this regulation shall be considered issued for purposes of judicial review at 1:00 p.m. Eastern time on April 22, 1983. These regulations shall become effective May 19, 1983.

The compliance date for the BAT regulations for both subcategories is as soon as possible, but no later than July 1, 1984 with one exception. The BAT compliance date for the nonconventional pollutant fluoride for the semiconductor subcategory is as soon as possible but no later than thirty-one months after the publication date. The compliance date for New Source Performance Standards (NSPS) and Pretreatment Standards for New Sources (PSNS) for both subcategories is the date the new source begins operations. The compliance date for Pretreatment Standards for Existing Sources (PSES) for arsenic regulated in the electronic crystal subcategory is thirty-one months after the publication date. For total toxic organics (TTO) the PSES compliance date for both subcategories is July 1, 1984.

Under Section 509(b)(1) of the Clean Water Act judicial review of this regulation can be obtained only by filing a petition for review in the United States Court of Appeals within 90 days after these regulations are considered issued for purposes of judicial review. Under Section 509(b)(2) of the Clean Water Act, the requirements of the regulations may not be challenged later in civil or criminal proceedings brought by EPA to enforce these requirements.

ADDRESSES: Technical information may be obtained by writing to Mr. David Pepson, Effluent Guidelines Division (WH-552), EPA, 401 M Street, S.W., Washington, D.C. 20460, or through calling (202) 382-7157. Copies of the technical documents may be obtained from the National Technical Information Service, Springfield, Virginia 22161 (703) 487-4600. Economic information may be obtained by writing to Ms. Renee Rico, Office of Analysis and Evaluation (WH-586), 401 M Street, S.W., Washington, D.C. 20460 or by calling (202) 382-5386. The economic analysis may also be obtained from the National Technical Information Service.

The record will be available for public review in approximately two weeks from publication in EPA's Public Information Reference Unit, Room 2004 (Rear) (EPA Library), 401 M Street, S.W., Washington, D.C. The EPA information regulation (40 CFR Part 2) provides that a reasonable fee may be charged for copying.

FOR FURTHER INFORMATION CONTACT: David J. Pepson at (202) 382-7157.

SUPPLEMENTARY INFORMATION:

Organization of This Notice

I. Legal Authority

This regulation is being promulgated under the authority of Sections 301, 304, 306, 307, 308, and 501 of the Clean Water Act (the Federal Water Pollution Control Act Amendments of 1972, 33 U.S.C. 1251 *et seq.*, as amended by the Clean Water Act of 1977, Pub. L. 95-217) also called the "Act". This regulation is also being promulgated in response to the Settlement Agreement in *Natural Resources Defense Council, Inc.* v. *Train*, 8 ERC 2120 (D.D.C. 1976), modified, 12 ERC 1833 (D.D.C. 1979), modified by Order dated October 26, 1982.

II. Scope of This Rulemaking

The purpose of this rulemaking is to establish effluent limitations and standards for existing and new semiconductor and electronic crystal manufacturing facilities. This regulation applies to wastewater generated from all process operations associated with the above industries except sputtering, electroplating, and vapor plating. The wastewater generated from these unit operations is subject to the final electroplating and proposed metal finishing effluent limitations and standards.

There are approximately 257 semiconductor plants in the United States; 77 of these plants are direct dischargers while the remaining 180 plants discharge to POTWs. The electronic crystal industry is comprised of 70 plants, 6 of which are direct dischargers and 64 of which are indirect dischargers.

EPA's 1973 to 1976 round of rulemaking emphasized the achievement of best practicable technology currently available (BPT) by July 1, 1977. In general, BPT represents the average of the best existing performances of well-known technologies for control of familiar (i.e., "classical") pollutants. This effort did not include rulemaking for the electrical and electronic components category.

The current round of rulemaking aims for the achievement by July 1, 1984, of the best available technology economically achievable (BAT) that will result in reasonable further progress toward the national goal of eliminating the discharge of all pollutants. At a minimum, BAT represents the performance of the best available technology economically achievable in any industrial category or subcategory. Moreover, as a result of the Clean Water Act of 1977, the emphasis of EPA's

program has shifted from "classical" pollutants to the control of toxic pollutants.

EPA is promulgating limitations based on BPT, BAT and BCT, new source performance standards (NSPS), pretreatment standards for existing sources (PSES), and pretreatment standards for new sources (PSNS).

III. Summary of Legal Background

A. The Clean Water Act and NRDC Settlement Agreement

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

The Act included a timetable for issuing these standards. However, EPA was unable to meet many of the deadlines and, as a result, in 1976, it was sued by several environmental groups. In settling this lawsuit, EPA and the plaintiffs executed a court-approved "Settlement Agreement." This Agreement required EPA to develop a program and adhere to a schedule in promulgating effluent limitations guidelines, pretreatment standards, and new source performance standards for 65 "priority" pollutants and classes of pollutants for 21 major industries. See *Natural Resources Defense Council Inc.* v. *Train,* 8 ERC 2120 (D.D.C. 1976), modified, 12 ERC 1833 (D.D.C. 1979), modified by Order dated October 26, 1982.

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

B. General Criteria for Effluent Limitations

Under the Act, the EPA program is to set a number of different kinds of effluent limitations. These are discussed in detail in the preamble to the 1982 proposal and the technical development document supporting these regulations. The following is a brief summary:

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

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

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

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

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

On October 29, 1982 the Agency proposed a revised BCT methodology. See 47 FR 49176. Although the Agency has not yet promulgated its revised BCT cost test methodology, we are promulgating BCT limitations as proposed for the semiconductor and electronic crystal industries. Application of the BCT cost test is not necessary for these industries for reasons presented in Section VII of this preamble.

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

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

6. Pretreatment Standards for New Sources (PSNS). Like PSES, PSNS are to control the discharge of pollutants to POTWs which pass through, interfere with, or are otherwise incompatible with the operation of the POTW. PSNS are to be issued at the same time as NSPS. New indirect dischargers, like new direct dischargers, have the opportunity to incorporate the best available

demonstrated technologies. The Agency considers the same factors in promulgating PSNS as it considers in promulgating NSPS.

C. Prior EPA Regulations

No regulations have ever been promulgated for the electrical and electronic components category. The Agency proposed regulations for Phase II of this category on March 9, 1983 (see 48 FR 10012).

IV. Methodology and Data Gathering Efforts

The methodology and data gathering efforts used in developing the proposed regulations were discussed in the preamble to the August, 1982 proposal. In summary, before proposal, the Agency conducted a data collection program at 20 semiconductor and electronic crystal plants. This program stressed the acquisition of data on the presence and treatability of the toxic pollutants. Analytical methods are discussed in *Sampling and Analysis Procedures for Screening of Industrial Effluents for Priority Pollutants* (U.S. EPA, April 1977). Based on the results of that program, EPA identified several distinct treatment technologies, including both end-of-pipe and in-plant technologies, that are or can be used to treat wastewaters from these industries.

For each of these technologies, the Agency compiled and analyzed historical and newly generated data on the performance of these technologies, considered the non-water quality impacts (including impacts on air quality, solid waste generation and energy requirements), and estimated the costs and economic impacts of applying it industrywide. Costs and economic impacts of the technology options considered are discussed in detail in *Economic Analysis of Final Effluent Limitations Guidelines and Standards for the Electrical and Electronic Components Point Source Category—Phase I.* A more complete description of the Agency's study methodology, data gathering efforts, and analytical procedures supporting the regulation can be found in the *Development Document for Effluent Limitations Guidelines and Standards for the Electrical and Electronic Components Point Source Category—Phase I.*

V. Industry Subcategorization

The Electrical and Electronic Components Point Source Category (E&EC) is derived from the Standard Industrial Classification (SIC) Major Group 36, Electrical and Electronic Machinery, Equipment and Supplies. Many of the industries listed under this SIC code were never evaluated as part of the E&EC category because EPA initially concluded that the wastewater discharges from these industries were primarily associated with the metal finishing category.

For industries included in the E&EC study, the Agency concluded that product type is an appropriate basis for subcategorization. Product type determines both the raw and process material requirements and the number and type of manufacturing processes used. Using product type as a basis, we established twenty-one (21) subcategories; seventeen (17) of these and one segment of another subcategory are excluded from regulation under Paragraph 8 of the NRDC Settlement Agreement. For two subcategories, electron tubes and luminescent coatings, we proposed regulations on March 9, 1983 (see 48 FR 10012). The remaining two subcategories, semiconductors and electronic crystals, are the subject of this final rule. The subcategories excluded under Paragraph 8 are discussed in Section XI of this notice.

The semiconductor subcategory is comprised of plants manufacturing solid state electrical devices which perform functions such as information processing and display, power handling, and interconversion between light energy and electrical energy. Semiconductors include light emitting diodes (LEDs), diodes and transistors, silicon based integrated circuits, and liquid crystal display (LCD) devices.

The electronic crystal subcategory is comprised of plants manufacturing crystals or crystalline material which are used in electronic devices. These crystals include quartz, ceramic, silicon, and gallium arsenide.

VI. Available Wastewater Control and Treatment Technology

A. Status of In-Place Technology

This section describes the status of in-place technology for the two subcategories to be regulated by this rulemaking, semiconductors and electronic crystals. These technologies cover the following pollutants of concern that were detected in EPA's sampling and analysis efforts: toxic organics, arsenic, fluoride, total suspended solids, and pH.

Wastewater treatment techniques currently used in the semiconductor and electronic crystal industries include both in-process and end-of-pipe waste treatment. In-plant process waste treatment is designed to remove pollutants from contaminated manufacturing process wastewater at some point in the manufacturing process. End-of-pipe treatment is wastewater treatment at the point of discharge.

In-process controls in widespread use in both subcategories include collection of spent solvents for resale or reuse and treatment of contract hauling of the concentrated fluoride waste stream. Contract hauling, in this instance, refers to the industry practice of contracting with a firm to collect and transport wastes for off-site disposal. A few plants in these subcategories practice recycle of the dilute acid rinse stream.

End-of-pipe controls consist primarily of neutralization which is practiced by all direct dischargers in both subcategories. One plant in the electronic crystal industry also uses end-of-pipe precipitation/clarification for control of arsenic and fluoride. Further, all six (6) direct dischargers in the electronic crystal subcategory have already installed end-of-pipe neutralization and precipitation/clarification for control of pH, TSS, and fluoride.

B. Control Treatment Options

EPA considered the following treatment and control options for wastewater discharges from facilities within the semiconductor and electronic crystals subcategories.

Option 1—Neutralization for pH control and solvent management for control of toxic organics. Solvent management is not a treatment system, but rather in-plant control of spent solvents either manually or mechanically through minor piping modifications. Effective solvent management includes well designed segregation controls or practices, collection of routine spills and leaks, and a rigorous employee training program. Since the spent solvents would not be discharged into the wastewater, toxic organic limitations based on this control would be equivalent to the maximum concentration of toxic organics found in the discharge as a result of process wastewater contamination. Process wastewater is the only other source of toxic organics for these subcategories.

Option 2—Option 1 plus end-of-pipe precipitation/clarification for treatment of arsenic, fluoride, and total suspended solids (TSS).

Option 3—Option 1 plus in-plant treatment (precipitation/clarification) of the concentrated fluoride stream.

Option 4—Option 2 plus recycle of the treated effluent stream for further reduction of fluoride.

Option 5—Option 2 plus filtration for reduction of fluoride, arsenic, and suspended solids.

Option 6—Option 2 plus carbon adsorption for further reduction of toxic organic concentrations.

VII. Summary of Final Regulations and Changes From Proposal

This section describes the technology bases and final effluent limitations for each subcategory and discusses the changes we have made in response to public comments.

A. Semiconductors

The pollutant parameters of concern that were detected in EPA's sampling and analysis efforts are pH, fluoride, and toxic organics.

1. BPT. The regulated pollutants are pH and toxic organics. EPA is promulgating BPT based on neutralization for pH control, and solvent management for control of toxic organics (Option 1). As in the proposed rule, toxic organics are being regulated as the total of all toxic organics found in the discharge at concentrations greater than 0.01 milligrams per liter. This limit is defined as total toxic organics (TTO) and the specific toxic organic compounds included in the total are listed in Appendix B. We have added four toxic organics to the proposed TTO list; these are carbon tetrachloride, 1,2 dichloroethane, 1,1,2 trichloroethane, and dichlorobromomethane. As with all other toxic organics included on the TTO list, these toxic organics were found in the effluent from plants in the semiconductor and electronic crystal subcategories at concentrations greater than 0.01 milligrams per liter. The addition of these toxic organics serves only to correct an inadvertent error at proposal and does not substantively affect either the final TTO limit or a plant's ability to achieve compliance with the TTO limit.

While we have not changed the proposed technology basis for BPT, we have changed the TTO limit from 0.47 mg/l to 1.37 mg/l. The revised TTO limit reflects a change in the methodology for deriving the TTO limit.

The methodology for determining the proposed TTO limit consisted of graphing all the effluent TTO data and then examining the graph to locate a point at which a distinct separation occurred in the magnitude of the TTO effluent concentrations. This break point was selected at the TTO effluent limit. The Agency concluded that the concentrations falling below the breakpoint reflected the solvent management practices of the best performing plants, whereas those above the breakpoint reflected poor practice of solvent management. The concentrations of TTO below the 0.47 mg/l breakpoint were attributed to process wastewater contamination.

Several commenters criticized this approach for establishing the TTO limit. These commenters argued that the extreme differences in the effluent TTO concentrations of the sampled plants result from varying degrees of process contamination, and not from the failure to practice proper solvent management. In response to this comment, the Agency revised its methodology for deriving the TTO limit. In contrast to the proposed derivation of the TTO limit, the revised methodolgy, described below, places greater emphasis on process wastewater TTO data.

Based on an examination of the available data and information, we identified the process operations which contribute toxic organics to the effluent via process wastewater contamination. To determine the TTO effluent contribution from each of these streams, we multiplied the measured TTO concentration by the ratio of the plant reported flow for that stream to the total plant effluent. The final TTO limit of 1.37 mg/l is derived from summing the TTO contribution from each of the process wastewater streams. In cases where we had several data points for a particular wastewater stream, we used the worst case TTO contribution in computing the TTO limit. This method of analyzing the TTO data ensures that the TTO limit accounts for all sources and amounts of toxic organics found in the effluent as a result of process wastewater contamination. Therefore, it is EPA's position that concentrations of TTO found in excess of the TTO limit result from dumping of spent solvent or chemical bath solutions that occurs as a result of poor solvent management or the failure to practice solvent management at all.

The Agency is not promulgating a 30 day average limitation for TTO. The daily maximum limitation for TTO is based on solvent management which, unlike most treatment options, does not entail pollution control equipment and is therefore not subject to significant performance variations.

By comparing the revised TTO limit to the effluent TTO concentration at the sampled plants, we estimate that 53 percent of the plants are already in compliance with the BPT TTO limitation. Accordingly, we find that the in-process controls which form the basis of BPT are widely practiced in this industry. EPA estimates that attainment of BPT will result in the removal of 80,000 kilograms per year of toxic organics at a total annual cost of 187 thousand dollars. No adverse economic impacts are expected. Thus, we conclude that the effluent reduction benefits justify the costs. For a further discussion of the derivation of the TTO limit, see Section XII of this notice and Section VII of the *Development Document for Effluent Limitations Guidelines and Standards for the Electrical and Electronic Components Point Source Category—Phase I.*

Option 2 was not selected as the technology basis for BPT because, in the semiconductor subcategory, Option 3 can be substituted for and is also less expensive than Option 2. Fluoride in this industry is primarily generated from a particular process stream, hydrofluoric acid etching. Option 3 (in-plant treatment) treats the smaller volume, highly concentrated etching wastestream and eliminates the need for end-of-pipe treatment of all process wastewater (as in Option 2). Option 3 was not selected because it is more appropriately reserved for consideration under BAT. Options 4, 5, and 6 were not selected for the reasons provided under the BAT discussion.

2. BAT. For BAT, EPA is promulgating limitations based on solvent management and precipitation/clarification of the concentrated fluoride stream (Option 3). The regulated pollutants are toxic organics and fluoride. As discussed under BPT, toxic organics are being regulated as total toxic organics (TTO) and the TTO limit is being changed from 0.47 mg/l to 1.37 mg/l. The TTO limit is the only change from proposal.

Compliance with BAT will result in greater pollutant removal than BPT by reducing the amount of fluoride presently being dicharged by approximately 300,000 kilograms per year. The estimated compliance cost for BAT is $2.9 million annually.

Option 4 (Option 1 plus end-of-pipe precipitation/clarification followed by recycle of the treated effluent) was not selected because very few facilities have been able to solve serious operational problems associated with recycling. Therefore Option 4 is not adequately demonstrated in this industry to serve as the basis of national limitations. However, facilities located in areas which experience water shortages are encouraged to investigate this technology option. Option 5 (Option 1 plus end-of-pipe precipitation/clarification followed by filtration) was not selected because it would only achieve a three (3) percent increase in fluoride reduction.

Because our revised BAT limit for TTO is less stringent than the proposed limit, we again examined carbon adsorption (Option 6) to determine if this end-of-pipe treatment technology would now achieve greater toxic organic reduction than the BAT technology basis of in-plant control using solvent management. The estimated theoretical discharge of toxic organics after treatment using carbon adsorption would range from 0.7 mg/l to 1.7 mg/l depending on which and how many of the 30 regulated toxic organics were present in the wastewater discharge. Based on the theoretical discharge achievable using carbon adsorption, the Agency expects that a TTO limit based on this technology would result in minimal, if any, additional removal of TTO and is, therefore, again rejecting carbon adsorption as the basis for BAT. See Section 7 of the technical development document for a further discussion of the toxic organic removal achieved by carbon adsorption.

The BAT compliance date for TTO is the same as the compliance date for TTO under BPT because the limitations are identical. The compliance date for TTO is as soon as possible as determined by the permit writer; in no case may the compliance date be later than July 1, 1984. As discussed under BPT, 53 percent of all plants are already in compliance with the TTO limit.

The BAT compliance date for fluoride is as soon as possible as determined by the permit writer but in no case later than 31 months after the publication date of this regulation. The technology basis for the BAT fluoride limitations is precipitation/clarification. A survey conducted on precipitation/clarification treatment systems shows that, on average, plants require 31 months to design, install, and "start-up" such treatment systems.

3. BCT. As proposed, EPA is promulgating pH limitations for BCT based on the BPT technology since BPT achieves the maximum feasible control for pH. Since BPT is the minimal level of control required by law, no possible application of the BCT cost tests could result in BCT limitations lower than those being promulgated today. Accordingly, there is no need to wait until EPA finalizes the BCT methodology before promulgating a BCT limitation for pH. There are no other conventional pollutants of concern in the semiconductor subcategory as discussed in Section VIII of this preamble.

4. NSPS. For NSPS, the Agency is promulgating limitations based on solvent management, neutralization, and precipitation/clarification of the concentrated fluoride stream (Option 3). These technologies are equivalent to BAT for control of toxic organics and fluoride, and BCT for control of pH. EPA has determined that Option 3 is the best demonstrated technology for this subcategory. Other options were not selected for the same reasons presented under BAT.

The only change from proposed NSPS is the TTO limit. The TTO limit under NSPS is being changed from 0.47 mg/l to 1.37 mg/l for the reasons presented under BPT.

5. PSES and PSNS. For PSES and PSNS, the Agency is promulgating TTO (total toxic organics) limitations based on solvent management. Since biological treatment at well operated POTWs achieving secondary treatment does not achieve removal equivalent to BAT for TTO, pass through occurs. Effective solvent management can reduce TTO by over 99 percent while a POTW will only remove 13 to 97 percent of these same pollutants. Accordingly, EPA is promulgating PSES and PSNS based on technology equivalent to BPT/BAT/NSPS for reduction of TTO. As previously discussed under BPT, the TTO limit is being changed from 0.47 mg/l to 1.37 mg/l.

The compliance date for pretreatment standards for existing sources in the semiconductor subcategory is July 1, 1984, the same as the proposed date. EPA has determined that achievement by this date is feasible. Plants only need to improve the effectiveness of their solvent management program; they do not have to design and install new or sophisticated pollution control systems. There is no reason this cannot be done by July 1, 1984.

6. Monitoring/Certification Language. At proposal, as an alternative to TTO monitoring, we proposed to allow dischargers to certify that spent solvents are collected for resale or contract disposal instead of being discharged into the wastewater. The commenters supported the decision to develop the certification alternative but strongly objected to the proposed wording. EPA agrees with some of the comments (see Section XII) and has changed the final language accordingly. There are three major differences between the proposed and final language: (1) the discharger may now certify to the solvent management practices he is following to achieve compliance instead of certifying that he is in compliance with the limit, (2) the discharger is required to describe his solvent management plan in greater specificity to the permitting or control authority's satisfaction and certify that he is continuing to follow the solvent management plan, and (3) permitting authorities will incorporate the plan as a condition of the NPDES permit, and compliance with the plan will be required as a pretreatment standard.

7. Definitions. In response to a comment concerning the coverage of this subcategory, EPA has added a definition for semiconductor manufacturing.

B. Electronic Crystals

The pollutant parameters of concern that were detected in EPA's sampling and analysis efforts are arsenic, total toxic organics (TTO), fluoride, total suspended solids (TSS), and pH.

1. BPT. EPA is promulgating BPT based on Option 2, as proposed. This technology consists of Option 1 (solvent management and end-of-pipe neutralization) plus end-of-pipe precipitation/clarification. The regulated pollutants and pollutant parameters are total toxic organics (TTO), fluoride, arsenic, total suspended solids (TSS), and pH. Arsenic is only being regulated at facilities which manufacture gallium or indium arsenide crystals.

We are making two changes to the proposed BPT limitations for the electronic crystal subcategory. The first change is that the TTO Limit is being increased from 0.47 mg/l to 1.37 mg/l. The rationale for this change is set forth under BPT for the semiconductor subcategory. The second change from proposal is a slight increase in the daily maximum and thirty day arsenic limits which apply to gallium and indium arsenide producers.The daily maximum is being changed from 1.89 mg/l to 2.09 mg/l and the thirty day average is being changed from 0.68 mg/l to 0.83 mg/l. These changes correct a minor computational error in the statistical analyses of the data base at proposal.

The Agency is not promulgating a 30 day average limitation for TTO. As discussed under BPT for the semiconductor subcategory, the daily maximum limitation for TTO is based on solvent management which, unlike most treatment options, does not entail pollution control equipment and is therefore not subject to significant performance variations.

EPA estimates that compliance with BPT for this subcategory will result in the removal of 1000 kilograms per year of toxic organics at an annual cost of $15 thousand. No adverse economic impacts are projected; thus we conclude that the effluent reduction benefits justify the costs. Plants generating arsenic wastes have already installed the BPT model technology.

Option 3 was not selected as the basis for regulation because this technology

controls only one process stream, hydrofluoric acid etching, and therefore, does not control the arsenic and TSS found in other wastestreams. The selected option consists of end-of-pipe treatment technology and therefore controls the pollutants in all these wastestreams. Options 4 and 6 were not selected for reasons presented under BAT for the Semiconductor Subcategory. Option 5 was not selected for arsenic because the Agency has no data available to demonstrate that filtration will further reduce arsenic discharges. This option was also not selected for fluoride because, as previously stated under BAT for semiconductors, filtration would only reduce fluoride by three percent.

2. BAT. For BAT, EPA is promulgating limitations based on technology equivalent to BPT. As with BPT, we are changing the proposed TTO and arsenic limits. The new limits are the same as those presented under BPT.

The BAT compliance date for TTO, arsenic, and fluoride is the same as the compliance date for these pollutants under BPT because the limitations are identical. The compliance date is as soon as possible as determined by the permit writer; in no case, may the compliance date be later than July 1, 1984. Available information indicates that all direct dischargers in this subcategory presently have end-of-pipe precipitation/clarification for control of fluoride and for control of arsenic where found.

Option 3 was not selected as the basis for regulation for the same reason presented under BPT above. Options 4, 5, and 6 were not chosen for the reasons presented under BAT for the semiconductor subcategory.

3. BCT. For BCT, EPA is promulgating pH and TSS limitations based on technology eqivalent to BPT. For pH, BPT is equal to BCT for the same reason discussed under the semiconductor subcategory. For TSS, the Agency considered the addition of filtration to BPT (Option 5), but rejected this technology option because of the minimal additional reduction of total suspended solids. Based on BPT, the average removal of TSS for each of the six(6) direct dischargers will be approximately 5400 kilograms per year. Filtration would only increase this amount by 100 kilograms per year (0.4 kgs/day) or by less than two percent (2%). Since there is no other technology option which would remove TSS, EPA is setting BCT equal to BPT. Accordingly, there is no need to conduct the BCT cost test.

4. NSPS. For NSPS, EPA is promulgating limitations based on solvent management, neutralization, and end-of-pipe precipitation/clarification. These technologies are eqivalent to BAT for toxic pollutants plus fluoride, and are equivalent to BPT/BCT for conventional pollutants. The only changes from the proposed NSPS concern the limitations for TTO and arsenic, and these changes have been previously discussed under BPT and BAT.

Other options were not selected as the technology basis for the regulation because, as explained under BAT for the semiconductor subcategory, these model technologies would result in minimal, if any, additional pollutant removal. EPA has determined that Option 2 is the best demonstrated technology for this subcategory.

5. PSES and PSNS. Both TTO and arsenic will be removed to a greater extent by BAT than by biological treatment at well operated POTWs achieving secondary treatment. Effective solvent management can reduce TTO by over 99 percent while a POTW will remove 13 to 97 percent of these same pollutants. Similarly precipitation/clarification of arsenic will remove over 92 percent of this pollutant while a POTW will only remove 35 percent. Therefore, PSES and PSNS are required to prevent pass through. For PSES and PSNS, EPA is promulgating limitations based on solvent management, neutralization, and end-of-pipe precipitation/clarification (Option 2) for the facilities which manufacture gallium or indium arsenide crystals. For facilities which only manufacture other types of crystals, PSES and PSNS are based on solvent management (Option 1). Option 2 will control arsenic in addition to controlling toxic organics. Proposed pretreatment standards for TTO and arsenic are being changed as previously discussed under BPT and BAT.

The compliance date for PSES is as soon as possible but no later than July 1, 1984 for TTO and as soon as possible but no later than 31 months from publication for arsenic. To comply with the TTO standard plants only need to improve the effectiveness of their solvant management program; they do not have to design and install new or sophisticated pollution control systems. The compliance date for arsenic for PSES is longer than for BAT because, unlike direct dischargers, indirect dischargers have not in all cases installed treatment technology. The design, installation, and start-up of the precipitation/clarification system on which the arsenic standard is based is estimated to take 31 months according to data in the public record.

6. Monitoring/Certification Language. As discussed under the semiconductor subcategory, at proposal, as an alternative to TTO monitoring, we proposed to allow dischargers to certify that spent solvents are collected for resale or contract disposal instead of being discharged into the wastewater. The commenters supported the decision to develop the certification alternative but strongly objected to the proposed wording. EPA agrees with some of the comments (see Section XII) and has changed the final language accordingly. There are three major differences between the proposed and final language: (1) The discharger may now certify to the solvent management practices he is following to achieve compliance instead of certifying that he is in compliance with the limit, (2) the discharger is required to discribe his solvent management plan in greater specificity to the permitting or control authority's satisfaction and certify that he is continuing to follow the solvent management plan, and (3) permitting authorities will incorporate the plan as a condition of the NPDES permit, and compliance with the plan will be required as a pretreatment standard.

7. Definitions. In response to a comment concerning the coverage of this subcategory, EPA has added a definition for electronic crystal manufacturing.

VIII. Executive Order 12291 and Regulatory Flexibility Analysis

Executive Order 12291 requires EPA and other agencies to perform regulatory impact analyses of major regulations. Major rules are those which impose a cost on the economy of $100 million a year or more or have certain other economic impacts. This regulation is not a major rule because its annualized cost of $4.4 million is less than $100 million and it meets none of the other criteria specified in paragraph 1(b) of the Executive Order.

Public Law 96–354 requires EPA to prepare an Initial Regulatory Flexibility Analysis for all proposed regulations that have a significant impact on a substantial number of small entities. This analysis may be done in conjunction with or as a part of any other analysis conducted by the Agency. The economic impact analysis described above indicates that there will not be a significant impact on any segment of the regulated population, large or small. Therefore, a formal regulatory flexibility analysis is not required.

IX. Costs and Economic Impacts

The Agency's economic impact assessment of this regulation is presented in *Economic Analysis of Effluent Standards and Limitations for the Electrical and Electronic Components Category—Phase I.* The analysis details the investment and annual costs for the two subcategories covered by the regulation: electronic crystals and semiconductors. The analysis also assesses the impact of effluent control costs in terms of profitability changes, capital availability, plant closures, production changes, employment effects, and balance of trade effects. Profits impacts are analyzed through estimated changes in and levels of return on assets and return on sales. Capital availability impacts are evaluated in relation to revenues for crystals and in relations to average plant and equipment expenditures for semiconductors. These impacts are then related to production changes, plant closures, and employment effects.

EPA has identified 70 establishments in the electronic crystal subcategory and 257 plants in the semiconductor subcategory that are covered by this regulation. Total investment costs for the two subcategories are estimated to be $5.6 million with an annual cost of $4.4 million, including interest and depreciation. No plant closures, employment impacts, or other economic impacts are expected to occur as a result of this regulation. Pollution control requirements for new sources in both subcategories are the same as for existing sources; thus, NSPS/PSNS are not expected to discourage entry or result in a cost disadvantage relative to current manufacturers. Each of the industry subcategories is discussed separately below.

A. Semiconductor Subcategory

Toxic Organics. BPT, BAT, PSES, NSPS and PSNS are controlled to the same level for toxic organics. These limitations and standards are expected to cause compliance costs consisting primarily of monitoring costs. This is because the costs associated with solvent disposal tend to be offset by resale of the solvents for other manufacturing processes. Based upon the estimate of facilities in both subcategories already in compliance with the toxic organics limitation, a number of facilities will have to improve their solvent management systems to comply. EPA projects, however, that the incremental costs incurred by these facilities will either be balanced out by resale of the spent solvents or result in slight additional net costs, therefore resulting in no significant economic impact. In any case, EPA performed a sensitivity analysis, assuming that the solvents were sent to hazardous waste disposal facilities covered by the Resource Conservation and Recovery Act. Worst case incremental compliance costs per plant ranged from $1,200 to $15,000, annually, and would be less than 0.2 percent of sales.

It is difficult to predict precisely how many plants will take advantage of the certification alternative to monitoring, although we expect most plants will want to do so. For purposes of costing, based upon our estimate we are assuming that 53 percent of existing plants already meet the toxic organic limit, and the same percentage, at a minimum, will also choose to certify. On average, EPA estimates that those plants who monitor will be required to do so quarterly. The monitoring costs for those plants would total $300 thousand in capital investment and $620 thousand annually. The impact of these costs is expected to be small, since they are less than 0.25 percent of sales. Some facilities may be required to monitor as frequently as once per month; therefore, EPA did a sensitivity analysis to assess the impact of monthly monitoring. These costs to such facilities are projected to be less than 0.4 percent of sales.

Thus, the sum total of all possible compliance costs for control of toxic organics is not expected to cause other than minor effects on profitability.

2. Fluoride. There are an estimated 77 direct dischargers covered by the BAT fluoride control requirements. Twenty-five of these plants already have treatment in place or haul their fluoride waste to landfills. Investment and annual costs for the remaining 52 plants (including monitoring) are estimated to be 4.3 million and 2.9 million, respectively, based on Option 3. Analysis of the post compliance profitabilities of these plants indicates that there would be some minor profit reduction for all plants in the industry; however, no plant closures or unemployment effects are expected. The analysis also indicates that these costs would be absorbed by the industry, thereby causing no increases in the prices of semiconductor products.

B. Electronic Crystal Subcategory

1. Toxic Organics. BPT, BAT, PSES, NSPS and PSNS are controlled to the same level for toxic organics. These limitations and standards are expected to cause compliance costs consisting primarily of monitoring costs.

This is because the costs associated with solvent disposal tend to be offset by resale of the solvents for other manufacturing processes. Again, based upon the fifty-three percent estimated compliance with the toxic organic limitations, the remaining facilities will have to improve their solvent management systems to comply. EPA projects, however, that the incremental costs incurred by these facilities will either be balanced out by resale of the spent solvents or result in slight additional net costs. In any case, EPA performed a sensitivity analysis, assuming that the solvents were sent to hazardous waste disposal facilities covered by the Resource Conservation and Recovery Act. Worst case incremental compliance costs ranged from $1,200 to $15,000 annually, and would result in post compliance return on investment (ROI) of no less than 27 percent.

It is difficult to predict precisely how many plants will take advantage of the certification alternative to monitoring, although we expect most plants will want to do so. For purposes of costing, based upon our estimate we are assuming that 53 percent of existing plants already meet the toxic organic limit, and the same percentage, at a minimum, will also choose to certify. On average, EPA estimates that those plants who monitor will be required to do so quarterly. These monitoring costs would total $70 thousand in capital investment and $135 thousand annually. The impact of these costs is expected to be small, since they result in post compliance ROIs of no less than 23 percent. Some facilities may be required to monitor as frequently as once per month; therefore, EPA did a sensitivity analysis to assess the impact of monthly monitoring. These costs to such facilities are projected to result in post compliance ROIs of no less than 22 percent.

Thus, the sum total of all possible compliance costs for control of toxic organics is not expected to cause other than moderate effects on profitability.

2. Arsenic. Costs incurred for PSES arise from treatment of arsenic resulting from processing operations. There are seven indirect dischargers that use arsenic in manufacturing crystals. Four of the seven plants already achieve the pretreatment standards and would incur no additional costs. Three plants must install additional treatment equipment. Investment costs for pollution control technologies are estimated to be $950 thousand with annual costs of $696 thousand. A plant specific analysis of these three establishments indicated that annual costs of compliance represent between 0.6 percent and 3.4

percent of the value of shipments. The economic analysis involved estimated return on sales, return on investment, and the ability to raise capital for the three plants. The profitability of the three plants may decline slightly as a result of the regulation, but any decline is not expected to cause plant closures or unemployment effects.

X. Non-Water Quality Aspects of Pollution Control

The elimination or reduction of one form of pollution may add to other environmental problems. Sections 304(b) and 306 of the Act require EPA to consider the non-water quality environmental impacts of these regulations including air and noise pollution, radiation, solid waste generation, and energy requirements.

Compliance with this regulation will have no effect on air, noise, or radiation pollution and will only result in minimal solid waste generation and minimal increased energy usage. The amount of solid waste generated per year will be 7700 metric tons per year. Available information indicates that the solid waste generated will not be hazardous as defined in the Resource Conservation and Recovery Act (RCRA). Energy requirements associated with these regulations will be 100,000 kilowatt-hours per year or only 7.5 kilowatt-hours per day per facility.

Based on the above non-water quality impacts from these requirements, EPA has concluded that this regulation best serves overall national environmental goals.

XI. Pollutants and Subcategories Not Regulated

A. Settlement Agreement

The Settlement Agreement contained provisions authorizing the exclusion from regulation, in certain circumstances, of toxic pollutants and industry categories and subcategories. These provisions have been rewritten in a Revised Settlement Agreement which was approved by the District Court for the District of Columbia on March 9, 1979, *NRDC* v. *Costle*, 12 ERC 1833.

Data supporting exclusion of the pollutants and subcategories identified below are presented in the Development Document for this rulemaking.

1. Exclusion of Pollutants. Ninety-five (95) toxic pollutants, listed in Appendix C, are being excluded from regulation for both the semiconductor and electronic crystal subcategories. The basis of exclusion for eighty-two (82) of these pollutants is Paragraph 8(a) (iii) which allows exclusion for pollutants which are not detectable with state-of-the-art analytical methods. The basis of exclusion for another nine (9) of these pollutants is provided by Paragraph 8(a)(iii) which also allows exclusion of pollutants which are present in amounts too small to be effectively reduced by technologies known to the Administrator. Four (4) toxic pollutants are being excluded from regulation because these pollutants are generated by unit operations (electroplating, sputtering, or vapor deposition) which will be subject to effluent limitations and standards promulgated under the metal finishing category. This is permitted by Paragraph 8(a)(iii).

In addition to the exclusion of the ninety-five (95) pollutants for both subcategories, another toxic pollutant is being excluded for the semiconductor subcategory only. This pollutant is arsenic and is being excluded under Paragraph 8(a)(iii) because it was found in amounts too small to be effectively treated by technologies known to the Administrator.

2. Exclusion of subcategories. Seventeen subcategories are being excluded from this regulation based on either paragraph 8(a)(iii) or paragraph 8 (a)(iv) of the Revised Settlement Agreement. Five subcategories are being excluded under Paragraph 8(a)(iii) because pollutants are found only in trace amounts and in quantities too small to be effectively reduced by treatment. These subcategories are magnetic coatings, mica paper, carbon and graphite products, fluorescent lamps, and incandescent lamps. (Incandescent lamps are being excluded on these grounds, with the exception of chromium which is excluded under paragraph 8(a)(iii) because the sulfuric-chromium acid cleaning process will be regulated under the metal finishing category). Eight subcategories are being excluded under Paragraph 8(a)(iii) because the pollutants will be effectively controlled by technologies upon which are based other effluent limitations and pretreatment standards. Six of the eight subcategories generate wastewater from unit operations which will be covered by metal finishing: these are switchgear, resistance heaters, ferrite devices, capacitors (fluid-filled), transformers (fluid-filled), and the subcategory of motors, generators, and alternators. Another subcategory, insulated devices, plastic and plastic laminated, will be covered by the plastic molding and forming regulation. The last subcategory, insulated wire and cable, will be covered by a number of other categories which include aluminum and aluminum alloys, copper and copper alloys, iron and steel, plastics processing, and metal finishing.

Two subcategories are being excluded from regulation under Paragraph 8(a)(iv) because no water is used in the manufacturing process; these are resistors and dry transformers. Another subcategory, fuel cells, is also being excluded under Paragraph 8(a)(iv) because there are only two or three plants in this subcategory and fuel cells are not manufactured on a regular basis.

Finally, one subcategory, fixed capacitors, is being excluded under both 8(a)(iii) and 8(a)(iv). All pollutants except copper and lead are being excluded under 8(a)(iii) because these pollutants are present only in trace amounts and are not found in treatable quantities. Copper generated by this subcategory is being excluded from regulation under Paragraph 8(a)(iii) because the unit operation which generates copper will be covered by metal finishing. Lead found in the subcategory is being excluded from regulation under Paragraph 8(a)(iv) because it is unique to two plants.

B. Conventional Pollutants

BOD, fecal coliform, and oil and grease are not being regulated for either subcategory because they were found at concentrations below treatability. Total suspended solids (TSS) is not being regulated in the case of semiconductors because it was found at an average concentration of 10 mg/l which is below treatability.

XII. Public Participation and Responses to Major Comments

On August 24, 1982, the Agency published proposed rules for effluent limitations guidelines, pretreatment standards, and new source performance standards under the Clean Water Act for the semiconductor and electronic crystal subcategories of the Electrical and Electronic Components Point Source Category. Following the publication of the proposed rules, we provided the technical development document and the economic document supporting the proposed rules to industry, environmental groups, government agencies, and the public sector. A workshop was held on the Electrical and Electronic Components BAT Rulemaking in San Francisco on October 15, 1982. On October 21, 1982, in Washington, D.C., a pretreatment public hearing was held at which eight persons presented testimony.

The comment period closed on October 25, 1982. Comments were received from the following: County Sanitation District of Los Angeles, Digital Equipment Corporation, Dionics, Inc., Fairchild Camera and Equipment

Corp., General Development Utilities, General Electric Co., General Motors Corp., Harris Corp., Hemlock Semiconductors Corp., Honeywell, Inc., Monsanto, Motorola, Inc., National Semiconductor, New York State Dept. of Environmental Control, RCA Corporation, Santa Clara Chamber of Commerce, Semiconductor Industry Association, Texas Instruments, Inc., and the U.S. Dept. of the Interior.

All comments received have been carefully considered, and appropriate changes in the regulations have been made whenever available data and information supported these changes. Major issues raised by commenters are addressed in Section VII and this section. A summary of all the comments received and our detailed responses to all comments are included in a report "Responses to Public Comments, Proposed Electrical and Electronic Components Effluent Guidelines and Standards", which is a part of the public record for this regulation.

1. Comment: The TTO limit of 0.47 mg/l is not achievable based on the proposed control technology of solvent management which consists of the collection of spent solvent baths. Many plants are practicing solvent management but do not achieve the proposed limit. EPA did not account for such plants. Further, in developing the proposed TTO limit, the Agency did not fully account for all process sources of toxic organics (e.g. scrubbers). An appropriate effluent TTO limit based on solvent management is 7.9 mg/l.

Response: EPA recognizes that these are plants which consider themselves as practicing solvent management but which do not meet the TTO effluent limitation that EPA states can be achieved. EPA purposefully did not consider all such plants in establishing the effluent limitations because plants vary in the effectiveness with which they practice solvent management. Under the Act, BPT limitations generally represent the average of the best performing plants and BAT represents the best performance economically achievable. Thus EPA does not base limits on the experience of plants with the poorest performance. To the extent that EPA's proposed limit was interpreted as reflecting the highest effluent concentration of TTO found at all plants practicing solvent management *regardless of the effectiveness of the solvent management program*, that interpretation is incorrect.

The Agency has revised its methodology for deriving the TTO limit to more explicitly address the contribution of TTO from process wastewater streams. The revised methodology results in a TTO limit of 1.37 mg/l compared with 0.47 mg/l at proposal. We have no data in the record, nor have any commenters submitted data, to support the claim that a TTO limit based on solvent management, as demonstrated by the best performing plants, should be 7.9 mg/l or otherwise higher than 1.37 mg/l. Solvent management is a demonstrated means of reducing the discharge of total toxic organics to low levels, and EPA sees no basis for establishing a less stringent limitation.

2. Comment: Many commenters objected to the certification language EPA proposed as an alternative to TTO monitoring. While the commenters agreed that certification is preferable to monitoring, some asserted that the only way to truthfully certify to the language EPA proposed would be to monitor continuously. Various alternatives were offered, such as certifying merely that the discharger practices solvent management. One commenter pointed out that EPA had recently proposed new certification language for signatories to permit applications and reports (40 CFR 122.6) as part of a settlement agreement in the consolidated permits litigation, (*NRDC* v. *EPA*, and consolidated cases, No. 80-1607, D.C. Cir.) and suggested that EPA adopt that language here. The specific certification language suggested from each commenter on this issue is presented in EPA's report "Response to Public Comments, Proposed Electrical and Electronic Components Effluent Guidelines and Standards—Phase I".

Response: EPA agrees that changes in the certification language are warranted. First, we believe it is appropriate to modify the proposed language to accord more closely with the certification language agreed to in the consolidated permits settlement agreement concerning 40 CFR 122.22, formerly § 122.6. 47 FR 25548, 25553 (June 14, 1982). We do not see a significant enough difference between this regulation and § 122.22 to justify substantially different language. Thus, we have adapted the proposed settlement language with minor differences reflecting the particular nature of the TTO certification requirement.

Second, we have amended the language to allow the discharger to certify that "no dumping of concentrated toxic organics into the wastewater has occurred since filing the last discharge monitoring report." The proposed language appeared to require the discharger to certify that he is in compliance with the limit; we recognize that it may be difficult to certify to this language in the absence of monitoring. Now the discharger will be allowed to certify as to his solvent management practices. However, because the new wording is less precise (i.e., no "dumping of concentrated toxic organics") and because some commenters pointed to the need for more specificity about certification procedures, we are adding more explicit language requiring the discharger to describe his solvent management plan. The proposed language would have required the discharger to specify the toxic organic compounds used and the procedure used to prevent excessive wastewater discharge of toxic organics, whereas the final language requires the discharger to submit a solvent management plan that specifies to the permitting or control authority's satisfaction the toxic organic compounds used; the method of disposal used instead of dumping, such as resale, reclamation, contract hauling, or incineration; and procedures for assuring that toxic organics do not routinely spill or leak into the wastewater. The discharger must also certify that the facility is implementing the solvent management plan.

Finally, for direct dischargers, the solvent management plan will be incorporated as a condition of their NPDES permits. A similar requirement does not exist for indirect dischargers since under the Clean Water Act permits are not issued for them by the control authority. However, the pretreatment standard does require indirect dischargers to implement the plan which they submit to the control authority. Both these requirements reinforce the discharger's responsibility to implement his certification statement.

We believe these changes will resolve many of the concerns raised by the commenters. We have rejected, however, the suggestions of some commenters that the discharger merely certify that a solvent management program is in effect. We do not believe that general certification of that sort provides sufficient assurance that dumping of used solvents is not occurring, or adequate means of enforcement.

We expect some dischargers may still find the amended certification language to be too restrictive. Such dischargers will have to monitor. Based on our survey of state and regional permitters, we estimate that, on average, monitoring for TTO will be required once per quarter. In some cases, plants may be required to monitor more frequently such as once per month. The annualized monitoring costs for these two sampling frequencies are estimated to range from

$5,500 to $15,000 per year, respectively. A sensitivity analysis of monthly costs shows no adverse economic impact. For a further discussion of the economic impacts resulting from monitoring, see the *Economic Impact Analysis of Effluent Limitations Guidelines and Standards for the Electrical and Electronic Components Point Source Category Phase I.*

As a final point we wish to emphasize that the addition of certification language does not in any way diminish the discharger's liability for noncompliance with the TTO limitation.

3. Comment: EPA's estimate of zero costs to comply with the TTO limit is not supported by the record.

Response: We do not claim that the TTO compliance costs will be absolutely zero, but rather, as explained at proposal, we expect compliance costs to be minimal. However, even accepting industry's assertion that we have significantly understated TTO compliance costs, we have costed the unlikely worst case compliance scenario which is disposal of spent solvents as a hazardous waste subject to RCRA requirements without recovery of residual value. The worst case incremental costs average $3600 per year with a range of $1200 to $15,000 per year depending on the extent to which plants are already collecting spent solvents. Our economic analysis of these costs show that the impact is insignificant, and justified by the effluent reduction. For further economic information on the impact of the TTO compliance costs, see *Economic Impact Analysis of Effluent Limitations Guidelines and Standards for the Electrical and Electronic Components Point Source Category Phase I.*

4. Comment: One commenter objected to the absence of pretreatment standards for fluoride. This commenter argued that EPA gave no reason for not controlling fluoride, that "pass through" as defined in the general pretreatment regulations occurs, and that there are available control technologies.

Response: We are not regulating fluoride under PSES or PSNS for either subcategory. A unique combination of reasons underlies this decision. Fluoride is not a toxic pollutant under the Act and EPA has more discretion concerning the establishment of pretreatment standards for such pollutants. In this particular instance fluoride is not a pollutant of concern for indirect dischargers. The average plant flow for the semiconductor category is 157,000 gallons per day and the average plant concentration of fluoride in the wastewater entering the POTW is 65.5 mg/l. Comparable figures for the electronic crystal subcategory are 29,000 gallons per day and 129 mg/l. EPA's environmental assessment, based on a substantial body of scientific literature, shows that there is little likelihood of health or environmental effects from the introduction of fluoride at these flows and concentrations into a POTW. For these reasons, EPA believes it is not appropriate to establish nationally applicable categorical pretreatment standards.

5. Comment: One commenter requested that the compliance date for pretreatment standards be extended from the proposed date of July 1, 1984 to three years from the date of promulgation. This commenter contends that the proposed compliance date does not allow plants sufficient time to properly design and install the treatment technologies needed to comply with pretreatment standards.

Response: The proposed pretreatment standards regulate toxic organics for all indirect dischargers and arsenic for plants which manufacture gallium or indium arsenide crystals. As previously discussed in section VI of this preamble, the control of toxic organics does not require the installation of any treatment technology and can be readily implemented. Consequently, we are not extending the compliance date for PSES for total toxic organics (TTO). However, we are extending the compliance date for PSES for arsenic from July 1, 1984 to 31 months from promulgation date, if necessary. The control of arsenic is based on precipitation and clarification and the design and installation of this treatment system requires, on average, 31 months.

XIII. Best Management Practices

Section 304(e) of the Clean Water Act authorizes the Administrator to prescribe "best management practices" ("BMP"), described in Section III of this preamble. EPA is not considering BMP for the electrical and electronic components category.

XIV. Upset and Bypass Provisions

A recurring issue is whether industry limitations and standards should include provisions that authorize noncompliance during "upsets" or "bypasses." An upset, sometimes called an "excursion," is unintentional noncompliance beyond the reasonable control of the permittee. EPA believes that upset provisions are necessary, because upsets will inevitably occur, even if the control equipment is properly operated. Because technology-based limitations can require only what technology can achieve, many claim that liability for upsets is improper. When confronted with this issue, courts have been divided on the questions of whether an explicit upset or excursion exemption is necessary or whether upset or excursion incidents may be handled through EPA's enforcement discretion. Compare *Marathon Oil Co.* v. *EPA*, 564 F.2d 1253 (9th Cir. 1977) with *Weyerhaeuser* v. *Costle, supra* and *Corn Refiners Association, et al.* v. *Costle*, No. 78-1069 (8th Cir. April 2, 1979). See also *American Petroleum Institute* v. *EPA*, 540 F.2d 1023 (10th Cir. 1976); *CPC International, Inc.* v. *Train*, 540 F.2d 1320 (8th Cir. 1976); *FMC Corp.* v. *Train*, 539 F.2d 973 (4th Cir. 1976).

Unlike an upset—which is an unintentional episode—a bypass is an intentional noncompliance to circumvent waste treatment facilities during an emergency.

EPA has both upset and bypass provisions in NPDES permits, and the NPDES permit regulations include upset and bypass permit provisions. See 40 CFR Part 122.22, 44 FR 32854, 32862-3 (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. Since permittees in the semiconductor and electronic crystal subcategories are entitled to the upset and bypass provisions in NPDES permits, this regulation does not repeat these provisions. Upset provisions are also contained in the general pretreatment regulation.

XV. Variances and Modifications

When the final regulation for a point source category is promulgated, subsequent Federal and State NPDES permits to direct dischargers must enforce the effluent standards. Also, the pretreatment limitations apply directly to indirect dischargers.

The only exception to the BPT effluent limitations is EPA's "fundamentally different factors" variance. See *E. I. duPont de Nemours and Co.* v. *Train, supra; Weyerhaeuser Co.* v. *Costle, supra.* This variance recognizes characteristics of a particular discharger in the category regulated that are fundamentally different from the characteristics considered in this rulemaking. This variance clause is included in the NPDES regulations and not in this regulation. See 40 CFR Part 125.30.

Dischargers subject to the BAT limitations are also eligible for EPA's "fundamentally different factors" variance. Further, BAT limitations *for*

nonconventional pollutants may be modified under Sections 301(c) and 301(g) of the Act. These statutory modifications do not apply to toxic or conventional pollutants.

The economic modification section (301(c)) gives the Administrator authority to modify BAT requirements for non-conventional pollutants [1] for dischargers who file a permit application after July 1, 1977, upon a showing that such modified requirements will: (1) Represent the maximum use of technology within the economic capability of the owner or operator and (2) result in reasonable further progress toward the elimination of the discharge of pollutants. The environmental modification section (301(g)) allows the Administrator, with the concurrence of the State, to modify BAT limitations for non-conventional pollutants from any point source upon a showing by the owner or operator of such point source satisfactory to the Administrator that:

(a) Such modified requirements will result at a minimum in compliance with BPT limitations or any more stringent limitations necessary to meet water quality standards;

(b) Such modified requirements will not result in any additional requirements on any other point or non-point source; and

(c) Such modification will not interfere with the attainment or maintenance of that water quality which shall assure protection of public water supplies, and the protection and propagation of a balanced population of shellfish, fish, and wildlife, and allow recreational activities, in and on the water and such modification will not result in the discharge of pollutants in quantities which may reasonably be anticipated to pose an unacceptable risk to human health or the environment because of bioaccumulation, persistency in the environment, acute toxicity, chronic toxicity (including carcinogenicity, mutagenicity or teratogenicity), or synergistic propensities.

Section 301(j)(1)(B) of the Act requires that application for modifications under section 301 (c) or (g) must be filed within 270 days after the promulgation of an applicable effluent guideline. Initial applications must be filed with the Regional Administrator and, in those States that participate in the NPDES program, a copy must be sent to the Director of the State program. Initial applications to comply with 301(j) must include the name of the permittee, the permit and outfall number, the applicable effluent guideline, and whether the permittee is applying for a 301(c) or 301(g) modification or both. Applicants interested in applying for both must do so in their initial application. For further details, see 43 FR 40859, September 13, 1978.

For the semiconductor subcategory, the nonconventional pollutant fluoride is not regulated at BPT, but is regulated at BAT. For this subcategory only, dischargers who file an initial application within 270 days after the publication of this regulation will be considered for 301(c) and 301(g) modifications. Modifications will be considered at the time the NPDES permit is reissued. Although the Agency intends to issue a regulation establishing criteria for 301(c) and 301(g) determinations, modifications will be made on a case-by-case basis until the 301(c) and 301(g) regulations are final.

Indirect dischargers subject to PSES are eligible for the "fundamentally different factors" variance and for credits for toxic pollutants removed by POTWs. See 40 CFR 403.7; 403.13; 46 FR 9404 (January 28, 1981). Indirect dischargers subject to PSNS are only eligible for the credits provided for in 40 CFR 403.7. New sources subject to NSPS are not eligible for EPA's "fundamentally different factors" variance or any statutory or regulatory modifications. See *E.I. duPont de Nemours* v. *Train, supra.*

XVI. Relation to NPDES Permits

The BPT, BAT and BCT limitations and SNPS in this regulation will be applied to individual plants through NPDES permits issued by EPA or approved State agencies under Section 402 of the Act. Under this regulation for the Electrical and Electronic Components Category, all limitations are concentration based. National mass based limitations are not provided because the Agency has determined that a fundamental relationship between production and pollutant loadings does not exist for either subcategory. See 40 CFR 122.45(f), formerly 122.63(f). Permitting authorities can derive mass based limitations by multiplying the concentration limit by the undiluted discharge flow.

The preceding section of this preamble discussed the binding effect of this regulation on NPDES permits, except when variances and modifications are expressly authorized. The following adds more detail on the relation between this regulation and NPDES permits.

One issue is how the regulation affects the authority of those that issue NPDES permits. EPA has developed the limitations and standards in this regulation to cover the typical facility for this point source category. In specific cases, the NPDES permitting authority may have to establish permit limits on toxic pollutants that are not covered by this regulation. This regulation does not restrict the power of any permit-issuing authority to comply with law or any EPA regulation, guideline, or policy. For example, if this regulation does not control a particular pollutant, the permit issuer may still limit the pollutant on a case-by-case basis, when such action conforms with the purposes of the Act. In addition, if State water quality standards or other provisions of State or Federal law require limits on pollutants not covered by this regulation (or require more stringent limits on covered pollutants), the permit-issuing authority *must* apply those limitations.

A final topic of concern is the operation of EPA's NPDES enforcement program, which was an important consideration in developing this regulation. The Agency emphasizes that although the Clean Water Act is a strict liability statute, EPA can initiate enforcement proceedings at its discretion (*Sierra Club* v. *Train* 557 F. 2d 485, 5th Cir., 1977). EPA has exercised and intends to exercise that discretion in a manner that recognizes and promotes good-faith compliance.

XVII. Availability of Technical Information

The basis for this regulation is detailed in four major documents. Analytical methods are discussed in *Sampling and Analysis Procedures for Screening of Industrial Effluents for Priority Pollutants.* EPA's technical conclusions are detailed in *Development Document for Effluent Guidelines, New Source Performance Standards, and Pretreatment Standards for the Electrical and Electronic Components Point Source Category—Phase I.* The Agency's economic analysis is presented in *Economic Impact Analysis of Effluent Limitations and Standards for the Electrical and Electronic Components Industry—Phase I.* A summary of the public comments received on the proposed regulation is presented in a report "Responses to Public Comments, Proposed Electrical and Electronic Components Effluent Guidelines and Standards", which is part of the public record for this regulation.

Technical information may be obtained by writing to David Pepson,

[1] Section 301(1) precludes the Administrator from modifying BAT requirements for any pollutants which are on the toxic pollutant list under section 307(a)(1) of the Act.

Effluent Guidelines Division (WH-552), EPA, 401 M Street, S.W., Washington, D.C. 20460 or through calling (202) 382-7157.

Additional information concerning the economic impact analysis may be obtained from Ms. Renee Rico, Economic Analysis Staff (WH-586), EPA, 401 M Street, S.W., Washington, D.C. 20460 or by calling (202) 382-5386. Copies of the technical and economic documents may be obtained from the National Technical Information Service, Springfield, Virginia 22161 (703) 487-4600.

XVIII. OMB Review

The regulation was submitted to the Office of Management and Budget for review as required by Executive Order 12291. Any comments from OMB to EPA and any EPA response to those comments are available for public inspection at Room M2404, U.S. EPA, 401 M Street S.W., Washington, D.C. 20460 from 9:00 a.m. to 4:00 p.m. Monday-Friday excluding Federal holidays.

In accordance with the Paperwork Reduction Act of 1980 (Pub. L. 96-511), the reporting and recordkeeping provisions in 40 CFR 469.13 and 469.23 that are included in this regulation will be submitted for approval to OMB. They are not effective until OMB approval has been obtained and the public is notified to that effect through a technical amendment to this regulation.

XIX. List of Subjects in 40 CFR Part 469

Electrical and electronic equipment, Water pollution control, Waste treatment and disposal.

Dated: March 31, 1983.

Lee M. Thomas,

Acting Administrator.

XX. Appendixes

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 under Section 304(b)(2)(B) of the Act.

BCT—The best conventional pollutant control technology, under Section 304(b)(4) of the Act.

BMP—Best management practices under Section 304(e) of the Act.

BPT—The best practicable control technology currently available under Section 304(b)(1) of the Act.

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

Direct Discharger—A facility which discharges or may discharge pollutants into waters of the United States.

Indirect Discharger—A facility which discharges or may discharge pollutants into a publicly owned treatment works.

NPDES Permit—A National Pollutant Discharge Elimination System permit issued under Section 402 of the Act.

NSPS—New source performance standards under Section 306 of the Act.

POTW—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 direct discharges under Sections 307 (b) and (c) of the Act.

RCRA—Resource Conservation and Recovery Act (Pub. L. 94-580) of 1976, as amended, 42 U.S.C. 6901 *et seq.*

Appendix B—List of Toxic Organics Comprising Total Toxic Organics (TTO)

1,2,4 trichlorobenzene chloroform
1,2 dichlorobenzene
1,3 dichlorobenzene
1,4 dichlorobenzene ethylbenzene
1,1,1 trichloroethane methylene chloride
napthalene
2 nitrophenol phenol bis(2-ethylhexyl)
phthalate tetrachloroethylene toluene
trichloroethylene
2 chlorophenol
2,4 dichlorophenol
4 nitrophenol pentachlorophenol di-n-butyl
phthalate anthracene
1,2 diphenylhydrazine isophorone butyl
benzyl phthalate
1,1 dichloroethylene
2,4,6 trichlorophenol carbon tetrachloride
1,2 dichloroethane
1,1,2 trichloroethane dichlorobromoethane

Appendix C—List of Pollutants Excluded From Regulation

The following nine (9) pollutants are being excluded from regulation in the semiconductor and electronic crystal subcategories under Paragraph 8(a)(iii) of the Settlement Agreement because they are present in amounts too small to be effectively reduced:

antimony
beryllium
cadmium
mercury
selenium
silver
thallium
zinc
cyanide

The following four (4) pollutants are being excluded under Paragraph 8(a)(iii) because these pollutants are generated by unit operations (electroplating, sputtering, or vapor deposition) which will be subject to effluent limitations and standards being promulgated under the metal finishing category:

lead
nickel
copper
chromium

The following eighty-two pollutants are being excluded under Paragraph 8(a)(iii) because they were not detected in the effluent.

acenaphthene
acrolein
acrylonitrile
benzene
benzidine
chlorobenzene
hexachlorobenzene
hexachloroethane
1,1-dichloroethane
1,1,2,2-tetrachloroethane
chloroethane
bis(2-chloroethyl) ether
2-chloroethylvinyl ether
2-chloronaphthalene
parachlorometa cresol
3,3'-dichlorobenzidine
1,2-trans-dichloroethylene
4,6-dinitro-o-cresol
N-nitrosodimentylamine
N-nitrosodiphenylamine
N-nitrosodi-n-propylamine
di-n-octyl phthalate
diethyl phthalate
benzo(a)anthracene
benzo(a)pyrene
3,4-benzofluorathene
benzo(k)fluoranthane
chrysene
acenphthylene
benzo(ghi)perylene
fluorene
phenanthrene
dibenzo(a,h)anthrene
ideno(1,2,3-cd)pyrene
pyrene
2,3,4,8-tetrachlorodibenzo-p-dioxin
1,2-dichloropropane
1,2-dichloropropylene
2,4-dimethylphenol
2,4-dinitrotoluene
2,6-dinitrotoluene
fluorathene
4-chlorophenyl phenyl ether
4-bromophenyl phenyl ether
bis(2-chloroisopropyl) ether
bis(2-chloroethoxy)methane
methyl chloride
methyl bromide
bromoform
chlorodibromemethane
hexachlorobutadiene
hexachlorocyclopentadiene
nitrobenzene
2,4-dinitrophenol
vinyl chloride
aldrin
dieldrin
chlordane
4,4'-DDT
4,4'-DDE
4,4'-DDD
a-endosulfan-Alpha
b-endosulfan-Beta
endosulfan sulfate
endrin
endrin aldehyde
heptachlor
heptachlor epoxice
a-BHC-Alpha
r-BHC-Beta
g-BHC-Delta

PCB-1242
PCB-1254
PCB-1221
PCB-1232
PCB-1248
PCB-1260
PCB-1016
toxaphene
asbestos
PCB-1248
PCB-1260
PCB-1016
toxaphene
asbestos

For the reasons stated above, EPA is establishing a new Part 469 of 40 CFR, Chapter I as follows:

PART 469—ELECTRICAL AND ELECTRONIC COMPONENTS POINT SOURCE CATEGORY

Subpart A—Semiconductor Subcategory

Sec.
469.10 Applicability; description of the semiconductor subcategory.
469.11 Compliance dates.
469.12 Specialized definitions.
469.13 Monitoring.
469.14 Effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT).
469.15 Effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT).
469.16 Pretreatment standards for existing sources (PSES).
469.17 New source performance standards (NSPS).
469.18 Pretreatment standards for new sources (PSNS).
469.19 Effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollution control technology (BCT).

Subpart B—Electronic Crystals Subcategory

469.20 Applicability; description of the electronic crystals subcategory.
469.21 Compliance dates.
469.22 Specialized definitions.
469.23 Monitoring.
469.24 Effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT).
469.25 Effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT).
469.26 Pretreatment standards for existing sources (PSES).
469.27 New source performance standards (NSPS).
469.28 Pretreatment standards for new sources (PSNS).
469.29 Effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollution control technology (BCT).

Authority: Secs. 301, 304, 306, 307, 308, 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, 33 U.S.C. 1311, 1314, 1316, 1317, 1318, and 1361; 86 Stat. 816, Pub. L. 92–500; 91 Stat. 1567, Pub. L. 95–217.

Subpart A—Semiconductor Subcategory

§ 469.10 Applicability.

The provisions of this subpart are applicable to discharges resulting from all process operations associated with the manufacture of semiconductors, except sputtering, vapor deposition, and electroplating.

§ 469.11 Compliance dates.

The compliance deadline for the BAT fluoride limitation shall be as soon as possible as determined by the permit writer, but no later than November 8, 1985. The compliance deadline for the BAT and BCT limitations for total toxic organics (TTO) and pH, respectively, is as soon as possible as determined by the permit writer, but in no event later than July 1, 1984. The compliance date for PSES for TTO is July 1, 1984.

§ 469.12 Specialized definitions.

The definitions in 40 CFR Part 401 and the chemical analysis methods in 40 CFR Part 136 apply to this subpart. In addition,

(a) The term "total toxic organics (TTO)" means the sum of the concentrations for each of the following toxic organic compounds which is found in the discharge at a concentration greater than ten (10) micrograms per liter:

1,2,4 trichlorobenzene chloroform
1,2 dichlorobenzene
1,3 dichlorobenzene
1,4 dichlorobenzene ethylbenzene
1,1,1 trichloroethane methylene chloride naphthalene
2 nitrophenol phenol bis(2-ethylhexyl) phthalate tetrachloroethylene toluene trichloroethylene
2 chlorophenol
2, 4 Dichlorophenol
4 nitrophenol pentachlorophenol di-n-butyl phthalate anthracene
1, 2 diphenylhydrazine isophorone butyl benzyl phthalate
1, 1 dichloroethylene
2, 4, 6 trichlorophenol carbon tetrachloride
1, 2 dichloroethane
1, 1, 2 trichloroethane dichlorobromomethane

(b) The term "semiconductors" means solid state electrical devices which perform functions such as information processing and display, power handling, and interconversion between light energy and electrical energy.

(c) The term "manufacture of semiconductors" means those processes, beginning with the use of crystal wafers, which lead to or are associated with the manufacture of semiconductor devices.

§ 469.13 Monitoring.

(a) In lieu of monitoring for TTO, the permitting authority may allow direct dischargers to include the following certification as a "comment" on the Discharge Monitoring Report required by § 122.44 (i), formerly § 122.62(i): "Based on my inquiry of the person or persons directly responsible for managing compliance with the permit limitation for total toxic organics (TTO), I certify that, to the best of my knowledge and belief, no dumping of concentrated toxic organics into the wastewaters has occurred since filing the last discharge monitoring report. I further certify that this facility is implementing the solvent management plan submitted to the permitting authority."

(b) In requesting that no monitoring of TTO be required, the direct discharger shall submit a solvent management plan that specifies to the permitting authority's satisfaction the toxic organic compounds used; the method of disposal used instead of dumping, such as reclamation, contract hauling, or incineration; and procedures for assuring that toxic organics do not routinely spill or leak into the wastewater. The permitting authority shall incorporate the plan as a provision of the permit.

(c) In lieu of monitoring for TTO, the control authority may allow industrial users of POTWs to make the following certification as a comment to the periodic reports required by § 403.12(e): "Based on my inquiry of the person or persons directly responsible for managing compliance with the pretreatment standard for total toxic organics (TTO), I certify that, to the best of my knowledge and belief, no dumping of concentrated toxic organics into the wastewaters has occurred since filing the last discharge monitoring report. I further certify that this facility is implementing the solvent management plan submitted to the control authority."

(d) In requesting that no monitoring be required, industrial users of POTWs shall submit a solvent management plan that specifies to the control authority's satisfaction the toxic organic compounds used; the method of disposal used instead of dumping, such as reclamation, contract hauling, or incineration; and procedures for assuring that toxic organics do not

routinely spill or leak into the wastewater.

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

Except as provided in 40 CFR Part 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 practicable control technology currently available (BPT):

SUBPART A—SEMICONDUCTOR BPT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Average of daily values for 30 consecutive days
	Milligrams per liter (mg/l)	
TTO [1]	1.37	[2]
pH	[3]	[3]

[1] Total toxic organics.
[2] Not applicable.
[3] Within the range of 6.0 to 9.0.

§ 469.15 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 Part 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):

SUBPART A—SEMICONDUCTOR BAT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Average of daily values for 30 consecutive days
	Milligrams per liter (mg/l)	
TTO [1]	1.37	[2]
Fluoride (T)	32.0	17.4

[1] Total toxic organics.
[2] Not applicable.

§ 469.16 Pretreatment standards for existing sources (PSES).

Except as provided in 40 CFR 403.7 and 403.13, any existing source subject to this subpart which 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):

(a)

SUBPART A—SEMICONDUCTOR 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)	
TTO [1]	1.37	[2]

[1] Total toxic organics.
[2] Not applicable.

(b) An existing source submitting a certification in lieu of monitoring pursuant to § 469.13 (c) and (d) of this regulation must implement the solvent management plan approved by the control authority.

§ 469.17 New source performance standards (NSPS).

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

SUBPART A—SEMICONDUCTOR NSPS EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Average of daily values for 30 consecutive days
	Milligrams per liter (mg/l)	
TTO [1]	1.37	[2]
Fluoride (T)	32.0	17.4
pH	[3]	[3]

[1] Total toxic organics.
[2] Not applicable.
[3] Within the range of 6.0 to 9.0.

§ 469.18 Pretreatment standards for new sources (PSNS).

Except as provided in 40 CFR Part 403.7, any new source subject to this subpart which 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):

(a)

SUBPART A—SEMICONDUCTOR 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)	
TTO [1]	1.37	[2]

[1] Total toxic organics.
[2] Not applicable.

(b) A new source submitting a certification in lieu of monitoring pursuant to § 469.13 (c) and (d) of this regulation must implement the solvent management plan approved by the control authority.

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

Except as provided in 40 CFR Part 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 conventional pollution control technology (BCT):

SUBPART A—SEMICONDUCTOR BCT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Average of daily values for 30 consecutive days
pH	[1]	[1]

[1] Within the range 6.0 to 9.0.

Subpart B—Electronic Crystals Subcategory

§ 469.20 Applicability.

(a) The provisions of this subpart are applicable to discharges resulting from the manufacture of electronic crystals.

§ 469.21 Compliance dates.

The compliance date for the BAT fluoride, arsenic and total toxic organic (TTO) limitations and the BCT limitation on total suspended solids (TSS) and pH is as soon as possible as determined by the permit writer, but in no event later than July 1, 1984. The compliance date for PSES for TTO is July 1, 1984 and for arsenic is November 8, 1985. The Consent Decree in *NRDC* v. *Train*, 12 ERC 1833 (D.D.C. 1979) specifies a compliance date for PSES of no later than June 30, 1984. EPA will be moving for a modification of that provision of the Decree. Should the Court deny that motion, EPA will be required to modify this compliance date accordingly.

§ 469.22 Specialized definitions.

The definitions in 40 CFR 401 and the chemical analysis methods in 40 CFR 136 apply to this subpart. In addition,

(a) The term "total toxic organics (TTO)" means the sum of the concentrations for each of the following toxic organic compounds which is found in the discharge at a concentration greater that ten (10) micrograms per liter:

1,2,4 trichlorobenzene chloroform
1,2 dichlorobenzene
1,3 dichlorobenzene
1,4 dichlorobenzene ethylbenzene
1,1,1 trichloroethane methylene chloride
naphthalene

2 nitrophenol phenol bis(2-ethylhexyl) phthalate tetrachloroethylene toluene trichloroethylene
2 chlorophenol
2,4 dichlorophenol
4 nitrophenol pentachlorophenol di-n-butyl phthalate anthracene
1,2 diphenylhydrazine isophorone butyl benzyl phthalate
1,1 dichloroethylene
2,4,6 trichlorophenol carbon tetrachloride
1,2 dichloroethane
1,1,2 trichloroethane dichlorobromomethane

(b) The term "electronic crystals" means crystals or crystalline material which because of their unique structural and electronic properties are used in electronic devices. Examples of these crystals are crystals comprised of quartz, ceramic, silicon, gallium arsenide, and idium arsenide.

(c) The term "manufacture of electronic crystals" means the growing of crystals and/or the production of crystal wafers for use in the manufacture of electronic devices.

§ 469.23 Monitoring.

The certification alternative to monitoring for Total Toxic Organics. (TTO) described in § 469.13(a) (b) (c) and (d) is applicable to this subpart.

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

Except as provided in 40 CFR 125.30–32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT):

SUBPART B—ELECTRONIC CRYSTALS BPT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Average of daily values for 30 consecutive days
	Milligrams per liter (mg/l)	
TTO [1]	1.37	[3]
Arsenic (T) [2]	2.09	0.83
Fluoride (T)	32.0	17.4
TSS	61.0	23.0
pH	[4]	[4]

[1] Total toxic organics.
[2] The arsenic (T) limitation only applies to manufacturers of gallium or indium arsenide crystals.
[3] Not applicable.
[4] Within the range of 6.0 to 9.0.

§ 469.25 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 available (BAT):

SUBPART B—ELECTRONIC CRYSTALS BAT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Average of daily values for 30 consecutive days
	Milligrams per liter (mg/l)	
TTO [1]	1.37	[3]
Arsenic [2]	2.09	0.83
Fluoride	32.0	17.4

[1] Total toxic organics.
[2] The arsenic limitation only applies to manufacturers of gallium or indium arsenide crystals.
[3] Not applicable.

§ 469.25 Pretreatment standards for existing sources (PSES).

(a) Except as provided in 40 CFR 403.7 and 403.13, any existing source subject to this subpart which 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—ELECTRONIC CRYSTALS 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)	
TTO [1]	1.37	[2]
Arsenic (T) [3]	2.09	0.83

[1] Total toxic organics.
[2] Not applicable.
[3] The arsenic (T) limitation only applies to manufacturers of gallium or indium arsenide crystals.

(b) An existing source submitting a certification in lieu of monitoring pursuant to § 469.13 (c) and (d) of this regulation must implement the solvent management plan approved by the control authority.

§ 469.26 New source performance standards (NSPS).

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

SUBPART B—ELECTRONIC CRYSTALS NSPS EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Average of daily values for 30 consecutive days
	Milligrams per liter(mg/l)	
TTO [1]	1.37	[2]
Arsenic(T) [3]	2.09	0.83
Fluoride(T)	32.0	17.4

SUBPART B—ELECTRONIC CRYSTALS NSPS EFFLUENT LIMITATIONS—Continued

Pollutant or pollutant property	Maximum for any 1 day	Average of daily values for 30 consecutive days
TSS	61.0	23.0
pH	[4]	[4]

[1] Total toxic organics.
[2] Not applicable.
[3] The arsenic(T) limitation only applies to manufacturers of gallium or indium arsenide crystals.
[4] Within the range of 6.0 to 9.0.

§ 469.27 Pretreatment standards for new sources (PSNS).

Except as provided in 40 CFR 403.7, any new source subject to this subpart which 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):

(a)

SUBPART B—ELECTRONIC CRYSTALS 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)	
TTO [1]	1.37	[2]
Arsenic (T) [3]	2.09	0.83

[1] Total toxic organics.
[2] Not applicable.
[3] The arsenic (T) limitation only applies to manufacturers of gallium or indium arsenide crystals.

(b) A new source submitting a certification in lieu of monitoring pursuant to § 469.13(c) and (d) of this regulation must implement the solvent management plan approved by the control authority.

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

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 conventional pollution control technology (BCT):

SUBPART B—ELECTRONIC CRYSTALS BCT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Average of daily values for 30 consecutive days
	Milligrams per liter (mg/l)	
TSS	61.0	23.0
pH	[1]	[1]

[1] Within the range of 6.0 to 9.0.

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