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Part III

Environmental Protection Agency

Electroplating and Metal Finishing Point Source Categories; Effluent Limitations Guidelines, Pretreatment Standards, and New Source Performance Standards

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 413 and 433

[OW-FRL-2383-7]

Electroplating and Metal Finishing Point Source Categories; Effluent Limitations Guidelines, Pretreatment Standards, and New Source Performance Standards

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: This regulation limits the pollutants that electroplating/metal finishing facilities may discharge to waters of the United States or to publicly owned treatment works (POTW). The Metal Finishing Regulations provide effluent limitations based on "best practicable technology" and "best available technology" and establish new source performance standards and pretreatment standards under the Clean Water Act. In addition, this rule amends the pretreatment standards for existing sources for the Electroplating Point Source Category.

The preamble summarizes the legal authority, background, technical and economic bases, and other aspects of the regulation as well as a summary of comments on the proposed regulation and on the record supporting the proposed regulation. The abbreviations, acronyms, and other terms used in the preamble are defined in Appendix A. (See "Supplementary Information" below for complete table of contents).

The final rule is supported by EPA's technical conclusions detailed in the *Development Document for Effluent Limitations Guidelines, and Standards for the Metal Finishing Point Source Category*, June, 1983. The Agency's economic analysis is found in *Economic Analysis of Effluent Standards and Limitations for the Metal Finishing Industry*, June 1983. Further supporting materials are filed in the record supporting this rulemaking.

DATES: In accordance with 40 CFR 100.01 (45 FR 26048) this regulation shall be considered issued for the purposes of judical review at 1:00 p.m. Eastern time on July 29, 1983. These regulations shall become effective August 29, 1983.

The compliance date for the BAT regulations is as soon as possible, but no later than July 1, 1984.

The compliance date for New Source Performance Standards (NSPS) and Pretreatment Standards for New Sources (PSNS) is the date the new source begins operations. The compliance date for Metal Finishing Pretreatment Standards for Existing Sources (PSES) is February 15, 1986 for metals and cyanide. Metal Finishing PSES establishes two levels of toxic organic control; the less stringent must be met by June 30, 1984 for most plants and by July 10, 1985 at plants also subject to Part 420 (Iron and Steel); the more stringent must be met by February 15, 1986. In addition, Electroplating PSES requires toxic organic control by July 15, 1986.

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 the purposes of judicial review. Under Section 509(b)(2) of the Clean Water Act, the requirements of the regulations may not be challenged in later civil or criminal proceedings brought by EPA to enforce these requirements.

Reporting provisions in 40 CFR 413.03 and 433.12 will be reviewed by OMB under the paperwork reduction act and are not effective until approved.

ADDRESS: Technical information may be obtained by writing to Mr. Richard Kinch, Effluent Guidelines Division (WH-552), Environmental Protection Agency, 401 M St., S.W., Washington, D.C. 20460, Attention: Metal Finishing Rules. Approximately two weeks from publication, the record for this rulemaking will be available for inspection and copying at the EPA Public Information Reference Unit, Room 2404 (Rear) PM-213 (EPA Library). The EPA public information regulation (40 CFR Part 2) provides that a reasonable fee may be charged for copying. Copies of the technical and economic documents may be obtained from the National Technical Information Service, Springfield, Virginia 22161 (703/487-4650). Copies of both documents will be available for review in the public record at EPA headquarters and regional libraries.

FOR FURTHER INFORMATION CONTACT: Mr. Richard Kinch, Effluent Guidelines Division (WH-552), EPA, 401 M Street, S.W., Washington, D.C. 20460, or by calling (202) 382-7159. Economic information may be obtained by writing Ms. Kathleen Ehrensberger, Economics Branch (WH-586), Environmental Protection Agency, 401 M St. S.W., Washington, D.C. 20460, or by calling (202) 382-5397.

SUPPLEMENTARY INFORMATION:

Organization of This Notice

I. Legal Authority
II. Background
A. The Clean Water Act
B. Prior EPA Regulations
C. Overview of the Industry
III. Scope of this Rulemaking
IV. Data Gathering Efforts
V. Sampling and Analytical Program
VI. Industry Subcategorization
VII. Available Wastewater Control and Treatment Technology
A. Status of In-Place Technology
B. Control Treatment Options
VIII. General Criteria for Limitations
A. BPT Effluent Limitations
B. BAT Effluent Limitations
C. BCT Effluent Limitations
C. BCT Effluent Limitations
D. New Source Performance Standards
E. Pretreatment Standards for Existing Sources
F. Pretreatment Standards for New Sources
IX. Summary of Final Regulations
A. Part 433
B. Part 413
X. Derivation of the Limitations
XI. Changes from the Proposed Limits
XII. Pollutants and Subcategories Not Regulated
A. Exclusion of Toxic Pollutants
B. Exclusion of Subcategories
XIII. Costs, Effluent Reduction Benefits, and Economic Impacts
A. Costs and Economic Impacts
B. Executive Order 12291
C. Regulatory Flexibility Analysis
D. SBA Loans
XIV. Non-Water-Quality Environmental Impacts
A. Air Pollution
B. Noise
C. Radiation
D. Solid Waste
E. Energy
XV. Best Management Practices (BMPs)
XVI. Upset and Bypass Provisions
XVII. Variances and Modifications
XVIII. Implementation of Limitations and Standards
A. Relation to NPDES Permits
B. Indirect Dischargers
C. Applicability and Compliance Dates
D. Enforcement
XIX. Summary of Public Participation
XX. Availability of Technical Information
XXI. OMB Review
XXII. List of Subjects
XXIII. Appendices
A. Abbreviations, Acronyms, and Other Terms Used in This Notice
B. Pollutants Excluded From Regulation
C. Unit Operations in the Metal Finishing Industry

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) (the "Act") and as further amended. 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), as modified, 12 ERC 1833 (D.D.C. 1979), modified by Order dated October 26, 1982.

II. Background

A. The Clean Water Act

The Federal Water Pollution Control Act Amendments of 1972 established a comprehensive program to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters," Section 101(a).

- Section 301(b)(1)(A) set a deadline of July 1, 1977, for existing industrial direct dischargers to achieve "effluent limitations requiring the application of the best practicable control technology currently available" ("BPT").
- Section 301(b)(2)(A) set a deadline of July 1, 1983, for those dischargers to achieve "effluent limitations requiring the application of the best available technology economically achievable . . . which will result in reasonable further progress toward the national goal of eliminating the discharge of all pollutants" ("BAT").
- Section 306 required that new industrial direct dischargers comply with new source performance standards ("NSPS"), based on best available demonstrated technology.
- Sections 307 (b) and (c) required pretreatment standards for new and existing dischargers to publicly owned treatment works ("POTW"). The Act made pretreatment standards enforceable directly against dischargers to POTW's (indirect dischargers), unlike the requirements for direct dischargers which were to be incorporated into National Pollutant Discharge Elimination System (NPDES) permits issued under Section 402.
- Section 402(a)(1) allows requirements for direct dischargers to be set case-by-case. However, Congress intended control requirements to be based for the most part on regulations promulgated by the Administrator of EPA.
- Section 304(b) required regulations that establish effluent limitations reflecting the ability of BPT and BAT to reduce effluent discharge.
- Sections 304(c) and 306 of the Act required regulations for NSPS.
- Sections 304(g), 307(b), and 307(c) required regulations for pretreatment standards.
- In addition to these regulations for designated industry categories, Section 307(a) required the Administrator to promulgate effluent standards applicable to all dischargers of toxic pollutants.
- Section 308 gave the Administrator authority to collect information necessary to develop and enforce regulations.
- Finally, Section 501(a) authorized the Administrator to prescribe any additional regulations "necessary to carry out his functions" under the Act.

EPA was unable to promulgate many of these regulations by the deadlines contained in the Act, and as a result—in 1976, EPA was sued by several environmental groups. In settling this lawsuit, EPA and the plaintiffs executed a "Settlement Agreement" which was approved by the Court. This agreement required EPA to develop a program and meet a schedule for controlling 65 "priority" pollutants and classes of pollutants. In carrying out this program EPA must promulgate BAT effluent limitations guidelines, pretreatment standards, and new source performance standards 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.

Several of the basic elements of the Settlement Agreement program were incorporated into the Clean Water Act of 1977. This law also makes several other important changes in the Federal water pollution control program.

- Sections 301(b)(2)(A) and 301(b)(2)(C) of the Act now set July 1, 1984 as the deadline for industries to achieve effluent limitations requiring application of BAT for "toxic" pollutants. "Toxic" pollutants here includes the 65 "priority" pollutants and classes of pollutants which Congress declared "toxic" under Section 307(a) of the Act.
- Likewise, EPA's programs for new source performance standards and pretreatment standards are now aimed principally at controlling toxic pollutants.
- To strengthen the toxics control program, Section 304(e) of the Act authorizes the Administrator to prescribe certain "best management practices" ("BMPs"). These BMPs are to prevent the release of toxic and hazardous pollutants from: (1) Plant site runoff, (2) spillage or leaks, (3) sludge or waste disposal, and (4) drainage from raw material storage if any of those events are associated with, or ancillary to, the manufacturing or treatment process.

In keeping with its emphasis on toxic pollutants, the Clean Water Act of 1977 also revises the control program for non-toxic pollutants.

- For "conventional" pollutants identified under Section 304(a)(4) (including biochemical oxygen demand, suspended solids, fecal coliform and pH), the new Section 301(b)(2)(E) requires "effluent limitations requiring the application of the best conventional pollutant control technology" ("BCT")—instead of BAT—to be achieved by July 1, 1984. The factors considered in assessing BCT for an industry are the relationship between the cost of attaining a reduction in effluents and the effluent reduction benefits attained, and a comparison of the cost and level of reduction of such pollutants by publically owned treatment works and industrial sources. For non-toxic, nonconventional pollutants, Sections 301 (b)(2)(A) and (b)(2)(F) require achievement of BAT effluent limitations within three years after their establishment or by July 1, 1984, whichever is later, but not later than July 1, 1987.

The purpose of this regulation is to establish BPT, BAT, NSPS, PSES, and PSNS for the Part 433 Metal Finishing Point Source Category, and to amend the Part 413 Electroplating PSES.

B. Prior EPA Regulations

On March 28, 1974, EPA promulgated BPT limitations for the electroplating industry but suspended them on December 3, 1976. Interim final pretreatment standards for the electroplating industry were issued on July 12, 1977, and suspended on May 14, 1979. On September 7, 1979, EPA promulgated the Part 413 PSES for the electroplating industry. Amended PSES were promulgated on January 28, 1981 (40 FR 9462).

Currently only those Electroplating PSES are in effect. Nonintegrated indirect discharging facilities must comply with those standards by April 27, 1984. See 47 FR 42698, September 28, 1982. A non-integrated facility is one which does not discharge significant process wastewater, other than from electroplating operations, through a treatment system (or proposed treatment system).

Integrated indirect discharging facilities are also currently covered by the electroplating PSES. These facilities, which prior to treatment combine electroplating waste streams with significant process waste streams not covered by the Electroplating Category, must comply with its provisions by June 30, 1984 (see 48 FR 2774, January 21, 1983).

C. Overview of the Industry

There are 13,500 plants in the electroplating/metal finishing industry. Many discharge wastewaters from

several metal finishing operations other than, and in addition to, electroplating. Part 413 (electroplating) currently applies only to flows from the six specified electroplating processes. These Part 433 (metal finishing regulations) will apply to those electroplating streams and also to wastestreams from most other metal finishing operations within the same plants. The Part 433 PSES will apply only to plants already covered by Part 413; however Part 433 will often cover additional wastewater within the same plants. Thus the Part 433 limits on discharge of toxic metals, toxic organics, and cyanide will apply to most facilities in the electroplating/metal finishing industry.

The industry can be divided into the sectors indicated on Table I. Facilities are either "captives" [those which in a calendar year own more than 50% (area basis) of the materials undergoing metal finishing]; or "job shops" [those which in a calendar year do not own more than 50% (area basis) of material undergoing metal finishing].

Captives can be further divided by two definitions: "integrated" plants are those which, prior to treatment, combine electroplating waste streams with significant process waste streams not covered by the electroplating category; "non-integrated" facilities are those which have significant wastewater discharges only from operations addressed by the electroplating category. Many captives (50%) are "integrated" facilities. Whereas captives often have a complex range of operations, job shops usually perform fewer operations. In theory job shops can be divided like captives; in actuality, however, approximately 97% of all job shops in this industry are "non-integrated".

Finally, the entire industry can be divided into "direct" and "indirect" dischargers. "Directs" discharge wastewaters to waters of the United States and are subject to NPDES permits incorporating BPT, BAT, and BCT limitations or NSPS. "Indirects" discharge to POTWs and are subject to PSES or PSNS.

As discussed above, the electroplating/metal finishing industry is currently covered by Part 413 PSES for the Electroplating Category promulgated on September 7, 1979, and amended on January 28, 1981. The effect of today's amendments is to create a new category—Metal Finishing (Part 433)—and to shift *most* electroplaters to it, replacing their current PSES with new limits which apply uniformly to discharges from their electroplating and other metal finishing operations. This meets industry's requests for equivalent limits for process lines often found together and greatly reduces the need to rely on the Combined Waste Stream Formula for integrated metal finishing facilities. Direct discharger and new source requirements are also being issued as part of the metal finishing regulations.

Indirect discharging job shop electroplaters and independent printed circuit board manufacturers, however, would be left under the existing Part 413 PSES for Electroplating and are exempted from Part 433. This is consistent with a 1980 Settlement Agreement in which the National Association of Metal Finishers (NAMF), and the Institute for Interconnecting and Packaging Electronic Circuits (IIPEC) agreed not to challenge the Part 413 PSES in return for the 1981 amendments and EPA's commitment that the Agency did not intend to develop significantly more stringent standards for those plants for the next several years.

TABLE I.—BREAKDOWN OF THE ELECTROPLATING/METAL FINISHING INDUSTRY

[Number of plants per sector 13,470]

	Job shops and IPCBM [1] (3,470)	Captive facilities (10,000)	
		Nonintegrated	Integrated
Indirect dischargers (10,561).	3,061 job & IPCBM indirect.	3,750 nonintegrated captive.	3,750 integrated captive
Direct dischargers (2,909).	409 job & IPCBM directs.	(2).....	(2).

[1] Independent printed circuit board manufacturers.
[2] 2,500 captive directs.

The Metal Finishing Category covers plants which perform one or more of the following six operations: electroplating, electroless plating, anodizing, coating (phosphating, chromating, and coloring), chemical etching and milling, or printed circuit board manufacture. If a plant performs any of those six operations then discharges from the 46 operations listed in Appendix C are covered by these standards.

In some cases another industrial category may cover wastewater discharges from a metal finishing operation. In such cases the more specific standards of the other Part(s) will apply to those wastewater streams which appear to be covered by both regulations. For example, if a plant performs coating operations in preparation for painting and also performs electroless plating as part of a porcelain enameling process, then these Part 433 standards would apply to discharges from the coating operation; while Part 466 (porcelain enameling) would apply to discharges from the second operation.

The following regulations will take precedence over metal finishing (Part 433) and electroplating (Part 413) when such an overlap occurs:

Nonferrous metal smelting and refining (40 CFR Part 421)
Coil coating (40 CFR Part 465)
Porcelain enameling (40 CFR Part 466)
Battery manufacturing (40 CFR Part 461)
Iron and steel (40 CFR Part 420)
Metal casting foundries (40 CFR Part 464)
Aluminum forming (40 CFR Part 467)
Copper forming (40 CFR Part 468)
Plastic molding and forming (40 CFR Part 463)

In addition, EPA is excluding from the metal finishing (Part 433) regulation: (1) Metallic platemaking and gravure cylinder preparation conducted within printing and publishing facilities; and (2) existing source job shops and independent printed circuit board manufacturers which introduce pollutants into a publicly owned treatment works. As noted above, the standards do not apply to facilities unless they perform at least one of the following: electroplating, electroless plating, anodizing, coating, chemical etching and milling, or printed circuit board manufacture.

The most important pollutants of concern found in metal finishing industry wastewaters are: (1) toxic metals (cadmium, copper, chromium, nickel, lead, and zinc); (2) cyanide; (3) toxic organics (lumped together as total toxic organics); and (4) conventional pollutants (TSS and oil and grease). These and other chemical constituents degrade water quality, endanger aquatic life and human health, and in addition corrode equipment, generate hazardous gas, and cause treatment plant malfunctions and problems in disposing of sludges containing toxic metals.

These plants manufacture a variety of products that are constructed primarily of metals. The operations, which involve meterials that begin as raw stock (rods, bars, sheet, castings, forgings, etc.), can include the most sophisticated surface finishing technologies. These facilities include both captives and job shops. They vary greatly in size, age, number of employees, and number and type of operations performed. They range from very small job shops with less than 10 employees to large facilities employing thousands of production workers. Because of differences in size and processes, production facilities are custom tailored to the individual plant. Some complex products may require the

use of nearly all of the 46 unit operations metioned above; a simple product may require only one.

Many different raw materials are used by these plants. Basis materials (or "workpieces") are mostly metals; from common copper and steel to extremely expensive high-grade alloys and precious metals. They can also include plastics. Solutions used in unit operations can contain acids, bases, cyanide, metals, complexing agents, organic additives, oils, and detergents. All these materials may enter waste streams during production.

Water use within the metal finishing industry is discussed fully in Section V of the development document (see summary above). Plating and cleaning operations are typically the biggest water users. While most metal finishing operations use water, some may use none at all. Water use depends heavily on the type—and the flow rate—of the rinsing used. Product quality requirements often dictate the amount of rinsing needed for specific parts. Parts involving extensive surface preparation will generally require larger amounts of water in rinsing.

III. Scope of this Rulemaking

This regulation establishes Part 433 BPT, BAT, NSPS, PSES, and PSNS for the Metal Finishing Point Source Category and amends Part 413 PSES for the Electroplating Point Source Category. The BAT goal is to achieve, by July 1, 1984, the best available technology economically achievable that will result in reasonable further progress toward the national goal of eliminating the discharge of all pollutants. This regulation does not alter the existing metal and cyanide standards for job shop electroplaters and printed circuit board manufacturers discharging to POTWs.

EPA first studied the electroplating/metal finishing industry to determine whether differences in raw materials, final products, manufacturing processes, equipment, age and size of plants, water use, wastewater constituents, or other factors required separate effluent limitations and standards for different industry subcategories. This study involved a detailed analysis of wastewater discharge and treated effluent characteristics, including, (a) the sources and volume of water, the processes, and the sources of pollutants and wastewater in the plant and (b) the constituents of wastewaters, including toxic pollutants. This analysis enabled the Agency to determine the presence and concentrations of toxic pollutants on the major wastewater discharges.

EPA also identified several distinct control and treatment technologies (both in-plant and end-of-pipe), including those with potential use in the electroplating/metal finishing industry. The Agency analyzed both historical and newly generated data on the performance of these technologies, including their non-water quality environmental impacts on air quality, solid waste generation, water scarcity, and energy requirements.

Cost curves were used to estimate the cost of each control and treatment technology. These cost curves were developed by applying standard engineering analyses to metal finishing wastewater characteristics. Unit process costs were than derived by applying model plant characteristics (production and flow) to the unit cost curve of each treatment process. These unit process costs were added together to yield the total cost at each treatment level.

By considering these factors, EPA was able to characterize the various control and treatment technologies used as the bases for effluent limitations, new source and pretreatment standards. However, the regulations do not require any particular technology. Rather, they require plants to achieve effluent limitations (mg/1) which reflect the proper operation of these technologies or equivalent technologies. Some facilities are already successfully using technologies other than those relied on by the Agency, such as dragout control, recycle, and recovery, to achieve these values.

IV. Data Gathering Efforts

To develop the regulation, EPA began with a review of previous work on the electroplating/metal finishing industry. The major source of information on this is the *Draft Development Document for Effluent Limitations and Standards for the Metal Finishing Point Source Category* (June 1980). Several studies completed before this development document was published also contributed technical information to the metal finishing data base for the following segments of the industry:

- Machinery and Mechanical Products Manufacturing.
- Electroplating.
- Electroless Plating and Printed Circuit Board Manufacturing (Segments of the Electroplating Category).
- Mechanical and Electrical Products.

We also gathered data on the metal finishing industry from literature surveys, inquiries to professional contacts, seminars and meetings, and the survey and evaluation of manufacturing facilities.

We contacted all Federal EPA regions, several State environmental agencies, and numerous suppliers and manufacturers for the metal finishing industry to collect information on: (1) Permits and monitoring data, (2) the use and properties of materials, (3) process chemical constituents, (4) waste treatment equipment, (5) waste transport, (6) and various process modifications to minimize pollutant generation.

Under the authority of Section 308 of the Clean Water Act, the Agency sent three different data collection portfolios (DCPs) to various industries within the Metal Finishing Point Source Category. The first DCP obtained data from 339 of 1,422 plants originally contacted from the machinery and mechanical products industry. The data included general plant information on raw materials consumed, specific processes used, composition of effluent streams, and wastewater treatment. The second DCP obtained data from 365 of the 900 plants originally contacted in the mechanical and electrical products industries. These data covered general plant characteristics, unit operations performed, plating type operations, wastewater treatment facilities, and waste transport. We sent the third DCP to 1,883 companies involved in electroplating. Approximately 1190 plants sent back economic analysis data and information on general plant characteristics, production history, manufacturing processes, process and waste treatment, wastewater characteristics, and treatment costs.

EPA and its contractors also visited 210 manufacturing facilities to collect wastewater samples and pertinent technical information on manufacturing processes and various treatment techniques.

V. Sampling and Analytical Program

EPA focused its sampling and analysis on the toxic pollutants designated in the Clean Water Act. However, we also sampled and analyzed conventional and nonconventional pollutants. Prior to undertaking sampling programs in support of rulemaking actions, EPA had to identify specific toxic pollutants that would be appropriate subjects for investigation. The list of 65 pollutants and classes of pollutants potentially includes thousands of specific compounds, the analyses of which could overwhelm private and government laboratory resources. To make the task more manageable, therefore, EPA selected 129 specific toxic pollutants for study in this rulemaking and other industry rulemakings. The criteria for

choosing these pollutants included the frequency of their occurrence in water, their chemical stability and structure, the amount of the chemical produced, and the availability of chemical standards for measurement.

In addition to the original 129 toxic pollutants (of which three are now considered nonconventional pollutants), EPA checked for the presence, frequency, and concentration of xylenes, alkyl epoxides, gold, fluoride, phosphorus, oil and grease, TSS, pH, aluminum, barium, iridium, magnesium, molybdenum, osmium, palladium, platinum, rhodium, ruthenium, sodium, tin, titanium, vanadium, yttrium, and total phenols.

The criteria used to select plants for sampling visits were: (1) A large percentage of the plant's effluent discharge should result from the manufacturing processes listed in Appendix C; (2) the physical layout of plant plumbing should facilitate sampling of the wastewater type under study; (3) the plant must have waste treatment in place; (4) the mix of plants visited should contain discharges to both surface waters and publicaly owned treatment works; and (5) the selected plants should provide a representative geographical distribution to avoid a data base that concentrates on a unique geographical condition. EPA sampled 210 facilities to identify pollutants in plant wastewaters. Before visiting a plant, EPA reviewed all available data on manufacturing processes and waste treatment. We selected representative points at which to sample the raw wastewater entering the treatment systems and the final treated effluents. Finally, we prepared, reviewed, and approved a detailed sampling plan showing the selected sample points and the overall sampling procedure.

Based on this sampling plan, we then took samples at each sample point for 1, 2 or 3 consecutive days. The samples were divided into two analytical groups. Within each group the samples were subjected to various analyses, depending on the stability of the pollutants to be analyzed. The various levels of analysis were conducted at: (1) Local laboratories, (2) EPA's Chicago laboratory, (3) contracted gas chromatography/mass spectrometry (GC/MS) laboratories, and (4) the sampling contractor's central laboratory. The sampling and analysis methods are outlined in the Development Document.

The acquisition, preservation, and analysis of the water samples followed the relevant methods set forth in 40 CFR 136. Although the Agency has not promulgated analytical methods for many organic toxic pollutants under Section 304(h) of the Act, a number of these methods have been proposed for 40 CFR 136 (44 FR 69464, December 3, 1979; 44 FR 75028, December 18, 1979).

VI. Industry Subcategorization

In developing this regulation, the Agency considered whether different effluent limitations and standards are appropriate for different segments of the metal finishing industry. The Act requires EPA to consider a number of factors to determine if subcategorization is needed. These factors include raw materials, final products, manufacturing processes, geographical location, plant size and age, wastewater characteristics, non-water-quality environmental impacts, treatment costs, energy costs, and solid waste generation.

The metal finishing industry comprises 45 unit operations. These processes generate wastewater that falls into five waste groups, each requiring different treatment to reduce the discharge of pollutants. The five groups are metals, cyanide, hexavalent chromium, oils, and solvents, with significant toxic organics pollutants potentially present in the last two.

These wastes occur in a wide variety of combinations. Throughout the industry, however the wastestreams are alike in one critical sense; they all respond similarly to the treatment system which is already most widely used in the industry. That system was selected as EPA's model technology. Its major components, i.e., precipitation and clarification, are used for all waste streams. After isolated treatment of hexavalent chromium, cyanide, and oil and grease, pollutants in these waste streams are further reduced by passage through the precipitation-clarification system which is also used for metal-bearing wastes.

The Agency has determined that the Metal Finishing Point Source Category need not be subcategorized for regulation. A set of concentration based limitations, based on the performance capabilities of the model technology, can be applied to all metal finishing process effluents.

EPA has, however decided to exempt indirect discharging job shops and independent printed circuit board manufacturers from the Part 433 PSES. This has an effect similar to placing them in a separate subcategory. As noted above, this is consistent with the 1980 Settlement Agreement in which the National Association of Metal Finishers promised to withdraw its legal challenge to those Part 413 PSES if EPA did not, for the next several years, make them significantly more stringent.

The Agency considered, but decided against production based standard. With the wide range of operations, product quality requirements, existing process configurations, and difficulties in measuring production, no consistent production normalizing relationship could be found. Concentration based limits, however, can be consistently attained throughout the industry.

VII. Available Wastewater Control and Treatment Technology

A. Status of In-Place Technology

Installed control and treatment technologies in the metal finishing industry generally consist of some form of alkaline precipitation and clarification installed at "end-of-pipe" to remove metals. When cyanide or hexavalent chromium wastes are present, these wastewaters are generally segregated and treated upstream.

B. Control Treatment Options

We examined the following control treatment options:

Option 1: Precipitation and clarification. Stream segregation for cyanide, hexavalent chromium and concentrated oily wastes followed by cyanide destruction, chromium reduction and emulsion breaking skimming as necessary. Solvent waste segregation and removal by hauling.

Option 2: Option 1 plus filtration.

Option 3: Option 1 plus in-plant control for cadmium.

VIII. General Criteria for Effluent Limitations

A. BPT Effluent Limitations

The factors considered in defining best practicable control technolgy currently available (BPT) include: (1) The total cost of applying the technology relative to the effluent reductions that result, (2) the age of equipment and facilities involved, (3) the processes used, (4) engineering aspects of the control technology, (5) process changes, (6) non-water-quality environmental impacts (including energy requirements), (7) and other factors, as the Administrator considers appropriate. In general, the BPT level represents the average of the best existing performances of plants within the industry of various ages, sizes, processes, or other common characteristics. When existing performance is uniformly inadequate, BPT may be transferred from a different subcategory or category. BPT focuses on

end-of-pipe treatment rather than process changes or internal controls, except when these technologies are common industry practice.

The cost/benefit inquiry for BPT is a limited balancing of costs versus benefits, committed to EPA's discretion, which does not require the Agency to quantify benefits in monetary terms. See e.g., *American Iron and Steel Institute* v. *EPA*, 526 F. 2d 1027 (3rd Cir. 1975). In balancing costs against the benefits of effluent reduction, EPA considers the volume and nature of existing discharges, the volume and nature of discharges expected after application of BPT, the general environmental effects of the pollutants, and the cost and economic impacts of the required level of pollution control. The Act does not require or permit consideration of water quality problems attributable to particular point sources, or water quality improvements in particular bodies of water. Therefore, EPA has not considered these factors. See *Weyerhaeuser Company* v. *Costle*, 590 F. 2d 1011 (D.C. Cir. 1978).

B. BAT Effluent Limitations

The factors considered in defining best available technology economically achievable (BAT) include the age of the equipment and facilities involved, the processes used, engineering aspects of the control technology, process changes, non-water-quality environmental impacts (including energy requirements), and the costs of applying such technology (Section 304(b)(2)(B)). The BAT level represents the best economically achievable performance of plants of various ages, sizes, processes, or other shared characteristics. As with BPT, uniformly inadequate performance within a category or subcategory may require transfer of BAT from a different subcategory or category. Unlike BPT, however, BAT may include process changes or internal controls, even when these technologies are not common industry practice.

The statutory assessment of BAT "considers" costs, but does not require a balancing of costs against effluent reduction benefits (see *Weyerhaeuser* v. *Costle, supra*). In developing BAT, however, EPA has given substantial weight to the reasonableness of costs. The Agency has considered the volume and nature of discharges, the volume and nature of discharges expected after application of BAT, the general environmental effects of the pollutants, and the costs and economic impacts of the required pollution control levels.

Despite this expanded consideration of costs, the primary factor for determining BAT is the effluent reduction capability of the control technology. The Clean Water Act of 1977, establishes the achievement of BAT as the principal national means of controlling toxic water pollution from direct discharging plants.

C. BCT Effluent Limitations

The 1977 amendments added Section 301(b)(2)(E) to the Act, establishing "best conventional pollutant control technology" (BCT) for discharges of conventional pollutants from existing industrial point sources. Section 304(B)(4) specified the following as conventional pollutants: BOD, TSS, fecal coliform, and pH. The Administrator designated oil and grease as "conventional" on July 30, 1979, 44 FR 44501.

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 costs to publicly owned treatment works 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).

BCT limitations for this industry were proposed on October 29, 1982 (47 FR 49176). They were accompanied by a proposed methodology for the general development of BCT limitations. BCT limits for this industry will be promulgated with, or soon after, the promulgation of the final methodology for BCT development. At that time EPA will respond to relevant comments filed in either that rulemaking or in this one.

D. New Source Performance Standards

The basis for new source performance standards (NSPS) under Section 306 of the Act is the best available demonstrated technology. New plants have the opportunity to design the best and most efficient metal finishing processes and wastewater treatment technologies. Therefore, Congress directed EPA to consider the best demonstrated process changes, in-plant controls, and end-of-pipe treatment technologies that reduce pollution to the maximum extent feasible.

E. Pretreatment Standards for Existing Sources

Section 307(b) of the Act requires EPA to promulgate pretreatment standards for existing sources (PSES), which industry must achieve within three years of promulgation. PSES are designed to prevent the discharge of pollutants which pass through, interfere with, or are otherwise incompatible with the operation of POTW's.

The legislative history of the 1977 Act indicates that pretreatment standards are to be technology-based, analogous to the best available technology for removal of toxic pollutants. The General Pretreatment Regulations which serve as the framework for the final metal finishing pretreatment standards are in 40 CFR Part 403, 46 FR 9404 (January 28, 1981).

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 removal by the BAT model treatment system. A study of 40 well-operated POTW's with biological treatment and meeting secondary treatment criteria showed that regulated metals are typically removed at rates varying from 20 to 70%. POTWs with only primary treatment have even lower rates of removal. In contrast, BAT level treatment by metal finishing industrial facilities can achieve removals of approximately 97% or more. Thus it is evident that metals from this industry do pass through POTW's. As for toxic organics, data from the same POTWs illustrate a wide range of removal, from 0 to greater than 99%. Overall POTW's have removal rates of toxic organics which are less effective than the metal finishing TTO technology basis of no dumping of toxic organic wastes. The POTW's effluent discharge of specific toxic pollutants ranged from 0 to 4.3 milligrams/liter. Many of the pollutants present in metal finishing wastes, at sufficiently high concentrations, can inhibit biodegradation in POTW operations. In addition, a high concentration of toxic pollutants in the sludge can limit POTW use of sludge management alternatives, including the beneficial use of sludges on agricultural lands.

Section 307 of the Clean Water Act provides that POTW's may grant credit to indirect dischargers, based on the degree of removal actually achieved at the POTW. EPA has General Pretreatment Regulations regulating POTWs' authority to grant such credits.

A Federal Register notice of September 28, 1982 explained EPA's latest data and proposed national removal credits for well operated POTW's achieving the national secondary treatment limits. See 47 FR 42696. That proposal is not being relied on in this rulemaking; however if such credits are available the costs of today's standards could be sustantially reduced.

F. Pretreatment Standards for New Sources

Section 307(c) of the Act requires EPA to promulgate pretreatment standards for new sources (PSNS) at the same time that it promulgates NSPS. These standards are intended to prevent the discharge of pollutants which pass through, interfere with, or are otherwise incompatible with a POTW. New indirect dischargers, like new direct dischargers, have the opportunity to incorporate the best available demonstrated technologies—including process changes, in-plant controls, and end-of-pipe treatment technologies—and to select plant sites that ensure the treatment system can be adequately installed. Therefore, the Agency sets PSNS after considering the same criteria considered for NSPS. PSNS will have effluent reduction benefits similar to NSPS.

IX. Summary of Final Regulations

In the electroplating/metal finishing industry, the pollutants of concern are cadmium, chromium, copper, lead, nickel, silver, zinc, cyanide, toxic organics, TSS, oil and grease, and pH. The treatment option selected for each effluent limitation, pretreatment standard and new source performance standard is based on the criteria specified in the Clean Water Act. The technologies are discussed in more detail in the Development Document for this rulemaking.

A. Part 433

The pollutants being regulated under BPT limitations are cadmium, copper, chromium, nickel, lead, silver, zinc, total cyanide, TSS, oil and grease and pH. Total toxic organics (TTO) is also being regulated. Compliance with the TTO limit basically involves not dumping concentrated toxic organic wastes, e.g., solvent degreasers and paint strippers. Other sources are generally small, infrequent, and of low concentrations.

For BPT, EPA is setting limits achievable by technology based on precipitation and clarification for all metal finishing effluents. In addition, for cyanide or hexavalent chromium the technology basis incorporates techniques to destroy cyanide and reduce hexavalent chromium to its trivalent state. These effluent limitations reflect the average of the best existing control technologies widely used in the industry and remove approximately 97.6 percent of the raw waste of toxic metals and cyanide, and 99 percent of the toxic organics discharged. The technology is consistent with that used as a basis for PSES for the electroplating industry (January 28, 1981, 40 FR 9462) and the March 28, 1974, suspended, BPT limitations. The limitations are derived in the manner discussed in the following section. They are generally more stringent than those found in currently effective electroplating pretreatment regulations, because EPA is now using a revised and updated data base.

For BAT, EPA is establishing limitations for the toxic pollutants and at a level equivalent to BPT. The Agency seriously consid d setting BAT and BAT-level PSES limitations based on BPT level technology plus filtration. Filtration would have led to an additional capital cost of almost $1.2 billion. In light of the statutory mandate to consider cost in setting BAT, EPA decided to reject the filtration option, because of its very high aggregate cost on a nationwide basis. We did not select in-plant cadmium control because it can require significant re-engineering of process water flow and of product and equipment handling, on a plant-by-plant basis. The changes vary widely and in many cases could be difficult for existing plants to apply. The compliance date for BAT is no later than July 1, 1984, the maximum time allowed by the Act.

For NSPS, EPA is establishing limitations based on BPT/BAT technology plus in-plant control of cadmium. This additional control takes advantage of a new plant's ability to achieve effluent reductions of 69% beyond BAT cadmium levels. The pollutants regulated under NSPS are the same as those regulated under BPT limitations.

For PSES in the Metal Finishing Category, limitations are based on technology equivalent to BAT and BPT. The pollutants regulated under this PSES are the same as the toxic pollutants regulated under BPT (BAT) limitations. A study of 40 well-operated POTWs with biological treatment and meeting secondary treatment criteria showed that regulated metals and cyanide are typically removed at rates varying from 20 to 70%. POTWs with primary treatment have even lower rates of removal. In contrast, metal finishing PSES-level treatment can achieve removals of approximately 97%. Thus it is evident that metals and cyanide from this industry do pass through POTWs. As for toxic organics, data from the same POTWs illustrates a wide range of removal, from 0% to greater than 99%. Overall POTWs have removal rates of toxic organics which are less effective than the metal finishing TTO technology basis of no dumping of toxic organic wastes. The POTWs effluent discharge of specific toxic pollutants ranged from 0 to 4.3 mg/1. Many of the pollutants present in metal finishing wastes at sufficiently high concentrations can inhibit biodegradation in POTW operations. In addition, a high concentration of toxic pollutants in the sludge can limit POTW use of sludge management alternatives, including the beneficial use of sludges on agricultural lands.

The compliance date for the metal finishing PSES is February 15, 1986 for metals, cyanide, and TTO. Agency analysis indicates that facilities can plan, design, and install the necessary equipment in 31 months, which will be allowed by the specified compliance date. There is also a June 30, 1984 compliance date for an interim toxic organic limit, which can be met by in-house management and handling controls.

For PSNS, limitations are based on technology equivalent to NSPS. The pollutants regulated under PSNS are the same as the toxics regulated under NSPS. As with PSES, these pollutants are necessary for control in PSNS to prevent pass through, interference, and sludge contamination.

B. Part 413

Indirect discharging job shops and independent printed circuit board manufacturers will continue to be regulated under the existing PSES for Electroplating. This is consistent with a 1980 Settlement Agreement in which the National Association of Metal Finishers and the Institute for Interconnecting and Packaging Electronic Circuits agreed not to challenge the Part 413 pretreatment standards for existing source electroplaters, in return for the 1981 amendments and an EPA commitment that, in light of their economic vulnerability, EPA did not plan to develop significantly more stringent standards for those plants for the next several years.

Control of toxic organics is being added to the requirements for facilities under the Electroplating PSES. Examination of the technology requirements, costs, economic impact, and timing indicates that requiring control of toxic organics is consistent with the Settlement Agreement.

First, it will not increase the economic vulnerability of job shops or independent printed circuit board manufacturers. Compliance with the toxic organic standards can be achieved by good management practices (i.e., not dumping waste solvents into the wastewaters). No additional end-of-pipe technology (beyond that already required by Part 413) is necessary. Economic analyses reveal that control of toxic organics does not impose significant additional costs or impacts.

Second, these facilities are being allowed 3 years to comply with the toxic organic standard. Thus, even if control of TTO were considered "more stringent", the time allowed for compliance will amount to 6 years from the date of the Settlement Agreement. That fulfills the Agency's obligation not to develop more stringent standards for these facilities in the next several years.

X. Derivation of the Limitations

EPA began development of these standards by building on the information obtained in developing the Electroplating Pretreatment Standards. For Metal Finishing, 2783 companies were contacted as part of two surveys (one of 1190 plants and the other of 365 plants) and 1555 useable questionaire responses were obtained. The Agency also selected 322 plants for visits and/or obtained long term self-monitoring data on them.

The data gathering effort was the basis for the Agency's first two critical determinations. First, pursuant to Section 307(b) of the Act, EPA identified those pollutants that would pass through or interfere with a POTW, or its sludge. Second, EPA discovered that a basic and "classic" pollution control technology was widely practiced in the industry. The system is designed to remove toxic metals from raw wastestreams and it has two principal components—precipitation and clarification. Of 1190 surveyed plants, 689 reported treatment present, of these, 426 facilities practiced the precipitation of metals through pH adjustment of wastewater.

EPA then analyzed the data to discover what those classic and commonly used treatment devices could achieve. For each regulated pollutant EPA looked for two key figures: The average concentration that properly operated technology would achieve over time, and the variability from that average that would be inevitable even at well-operated plants.

To find long-term concentration averages, EPA examined its file of 322 plants which had been visited and/or had sent long-term self-monitoring data to EPA. Of these plants EPA had sampled 72 with precipitation and clarification. After deletions for improper treatment, dilution, and low raw waste concentrations, 30 plants (sampled by EPA from 1 to 6 days) were used for developing the long-term concentration averages. For these plants, EPA had obtained detailed information on treated and untreated (raw) wastewater characteristics.

For most pollutants the average of this data was used for the long term average. EPA sampled data for cadmium and lead appeared too low to represent the range of raw wastes in the industry. For these parameters EPA used available self-monitoring data to calculate the long-term average. Although the Agency has less information on which to judge the adequacy of treatment in the self-monitoring data, these higher values were used by the Agency to compensate for the relatively low raw waste cadmium and lead at EPA sampled plants. The average of the self-monitoring data for lead and cadmium was used for the long-term average.

The regulations specify daily and monthly average maximums. Thus, the limits are developed from the Agency assessment of long term concentration averages multiplied by variability factors. If a plant intends to consistently comply with the regulatory limit it should use the long term concentration average as the basis for design and operation. The following long-term concentration averages were found to be attainable by the technology EPA assessed, and were costed in this rulemaking. They are presented here as guidance to dischargers and control authorities:

Long Term Concentration Averages

Pollutant of pollutant property	Long term concentration average milligrams per liter (mg/1)
Cadmium (T)	0.13
Chromium (T)	0.572
Copper (T)	0.815
Lead (T)	0.20
Nickel (T)	0.942
Silver (T)	0.096
Zinc (T)	0.549
Cyanide (T)	0.16
Cyanide, A	0.06

Long Term Concentration Averages—Continued

Pollutant of pollutant property	Long term concentration average milligrams per liter (mg/1)
Oil & Grease	11.8
TSS	11.16.8
TTO (raw waste)	1.06
TTO (effluent)	0.434

Variability factors were determined by looking at variations that have occurred in the past. This requires multiple observations at single treatment systems. The self-monitoring data collected by EPA provided approximately 12,000 self-reporting observations which were used to derive variability factors. The variability factors were derived by estimating 99th percentiles based on a lognormal distribution, and then dividing those numbers by the average. These Part 433 metal finishing standards are based on the variability expected for one-day and one-month time periods. The monthly variability factors were derived assuming the monthly average was comprised of ten daily observations.

Finally, the Agency multiplied the resulting variability factor by the expected long-term concentration averages. The results were effluent concentration limits based on actual observations of well-operated plants which allowed for the variability observed at all types of reporting facilities. EPA has assessed the cost of this regulation on the assumption that plants design and operate to meet these long term concentration averages. The final limits represent limits which a well-designed and operated plant should meet approximately 99% of the time. If a plant designs and operates its treatment system to achieve the long-term concentration average and reasonable control fluctuations, then it should have very little expectation of exceeding the promulgated limit for each sampling of the discharge.

XI. Changes From the Proposed Limits

As previously stated the limitations are derived using long-term averages and variability factors. Both of these items underwent some changes between proposal and promulgation.

With regard to long-term concentration averages only slight changes were made. Additional data were added to the data base for lead and zinc, and one plant's data for cadmium were excluded due to complexing problems. The long-term concentration average for lead changed

from 0.17 to 0.20 mg/1, zinc changed from 0.582 to 0.549 mg/1, and cadmium changed from 0.19 to 0.13 mg/1.

The derivation of the proposed TTO limit did not distinguish differences between plants. Comments suggested that plants with certain processes should be allowed a higher limit. EPA in response, examined grouping of plants by sources of TTO; e.g. those that perform solvent degreasing, and/or painting. Plants which performed both solvent degreasing *and* painting had higher raw waste TTO than any other process group. The final TTO limit is based on that process grouping, which is a conservative assumption since it had the highest background concentration. Furthermore, EPA is now promulgating two TTO limits for plants covered by Part 433. The first is based solely on background levels found prior to end-of-pipe treatment. It must be met by June 30, 1984, except that plants covered by Part 420 (iron and steel) need not meet it until July 10, 1985. The second TTO limit is based on effluent data and takes into account the additional removals achieved by end-of-pipe treatment. This second limit must be met by February 15, 1986. Most facilities should be able to meet this limit after installing end-of-pipe treatment to meet the electroplating PSES of Part 413. However Part 433 allows the period until February 15, 1986 in case additional process streams present special compliance problems.

For PSES, job shops and independent printed circuit board manufacturers are regulated only under Part 413. They will have until July 15, 1986 to comply with TTO. Thus "several years" will have followed the Settlement Agreement of 1980.

In calculating variability factors, changes were made to both the daily maximum variability and thirty day variability. First, the daily maximum variability was calculated in the proposal by using lognormal statistics for plants with less than 100 sampling days and a nonparametric procedure for plants reporting 100 or more observations. For the final regulation the Agency found that the larger data sets had a good fit to the lognormal distribution. Thus the Agency is using the lognormal procedure for all data sets. Second, 30 day limits based on the average of 30 samples have been replaced with a monthly average based on 10 samples per reporting period. This is consistent with other recent Effluent Guidelines for similar industrial categories.

In addition, the Agency responded to comments that the statistical methodology used in proposal did not predict percent exceedances of the 30 day limits consistently with the 99% criterion used to derive the limits. The main reason for this was that day to day dependence in the data was not accounted for in deriving the proposed limits. In deriving the 10 sample monthly limits, the Agency examined data dependence in three ways. First, by fitting the data to a statistical time series model; second, by incorporating direct computations of auto-correlations into derivations of the limits; and third, by fitting observed sequences of 10 day averages to a lognormal distribution. The final monthly limits were determined by fitting observed sequences of 10 day averages to a lognormal distribution because this provided the most satisfactory fit to the data. The general effect of these statistical changes was to raise some limits.

Another change is that an alternative amenable cyanide limit is made available to facilities with significant forms of cyanide (i.e., iron cyanides) not controllable by the technology basis.

XII. Pollutants and Subcategories not Regulated

Paragraph 8 of the Settlement Agreement contains provisions authorizing EPA to exclude toxic pollutants and industry categories and subcategories from regulation under certain circumstances.

A. Exclusion of Toxic Pollutants

Paragraph 8 (a) (iii) of the Settlement Agreement authorizes the Administrator to exclude from regulation toxic pollutants:

- Not detectable by Section 304(h) analytical methods or other state-of-the-art methods; or
- Present in amounts too small to be effectively reduced by available technologies; or
- Present only in trace amounts and neither causing nor likely to cause toxic effects; or
- Detected in the effluent from only a small number of sources within a subcategory and uniquely related to those sources; or
- That will be effectively controlled by technologies on which other effluent limitations and standards are based.

Appendix B to this notice indicates the reason for the exclusion of each toxic pollutant excluded from regulation on the basis of the paragraph 8 criteria.

B. Exclusion of Subcategories

In selecting effluent limitations for the Metal Finishing category as a whole, EPA has not established subcategories and, therefore, has not excluded any subcategories from toxic pollutant regulation. However, as discussed above, job shops and IPCBMs which are existing indirect dischargers remain subject to the less stringent Part 413 requirements.

XIII. Costs, Effluent Reduction Benefits, and Economic Impact

A. Cost and Economic Impacts

The economic impact assessment of this regulation is presented in *Economic Impact Analysis of Effluent Standards and Limitations for the Metal Finishing Industry*. The analysis details the investment and annual costs that the industry will incur as a result of this regulation. The report assesses the impact of effluent control costs in terms of plant closures, unemployment effects, and increases in the costs of production.

Since proposal, the economic impact analysis has been revised to reflect changes warranted on the basis of comments received and as a result of continued EPA review. Monitoring and compliance costs associated with the control of the regulated pollutants have been estimated for each industry sector and are presented below. Also, the economic analysis has been revised to reflect a current nominal cost of capital of 13 percent versus the 10 percent originally used. In addition, the Economic Analysis was revised to more clearly present supporting data from elsewhere in the record. Finally, the indirect discharging captive facilities with flows less than 10,000 gallons per day have been included in the analysis. Costs and impacts for this group are presented separately below. This industry group was inadvertently omitted from the earlier economic impact analysis.

In order to measure the potential economic impact, EPA reviewed its incremental effect on each of the sectors of the industry (described above in the "Overview of the Industry," and Table 1). These impacts are presented separately below for direct and indirect discharging facilities by job shop, independent printed circuit board shop and captive shop facilities. The incremental combined investment and annual costs, which include interest and depreciation, for all metal finishing facilities incurring costs are $351 million and $118 million respectively. These costs are in 1982 dollars, as are those presented below. No plant closures or employment effects are projected. Increases in the cost of production average 0.02 percent. If all 10,409 facilities using end-of-pipe treatment technologies are required by the

municipalities and permit writers to monitor 10 days per month, the total annual costs increase by $61 million from $118 million to $179 million. No closures or employments effects are projected to result from this level of monitoring; the average increase in cost of production would be 0.03 percent versus the 0.02 percent presented above. The Agency has determined that this regulation would be economically achievable even if all facilities are required to monitor 10 days a month. No measureable balance of trade effect is expected from this regulation due to the estimated small change in the price of metal finishing products.

BPT

Direct discharging facilities are not expected to incur costs to comply with the metals and cyanide limitations because these facilities are already covered by NPDES permits which set BPT limits on case-by-case best engineering judgments. A 1981 survey of randomly selected permits indicates that nearly all existing permits specify limits equivalent to, or more stringent than, those contained in this regulation.

Direct discharging facilities may incur costs to comply with the limitation on total toxic organics. EPA assessed TTO compliance costs on the assumption that all plants would incur baseline monitoring costs of $1,904 on a one time basis. EPA believes that almost all plants will then comply through the certification process. Nevertheless, EPA assumed that those facilities which currently dump would not be able to use the certification process and would incur annual compliance costs. (This same procedure was used for TTO compliance under PSES.) EPA has assumed that the annual BPT compliance costs could be $29,000 for job shops, $34,700 for independent printed circuit board manufacturers and $468,000 for captive shop facilities. These costs apply to 10 out of 365 direct discharging job shops, 12 out of 44 direct discharging independent printed circuit board manufacturers, and 162 out of 2,500 direct discharging captive shop facilities. Increases in the cost of production resulting from the control of TTO are not expected to exceed 0.9 percent. No closure or employment effects are projected for these sectors.

BAT

Since the BAT limitations are the same as the BPT limitations, there is no incremental cost or impact associated with compliance with the BAT limitations.

PSES

Indirect discharging job shop and independent printed circuit board facilities are expected to incur costs only to comply with the TTO limitation which is being added to the electroplating pretreatment standards in Part 413. This TTO limitation is included in the regulation because compliance will significantly reduce toxic organic pollution and will cause negligible economic impacts on these industry sectors. EPA is not imposing metals and cyanide limitations more stringent than those specified in the existing applicable pretreatment standards despite evidence that such limits can be reliably achieved by the technology that forms the basis of the current standards. This is consistent with a March 1980 Settlement Agreement in which the relevant trade associations agreed not to challenge the Part 413 pretreatment standards for existing source electroplaters.

Approximately 77 of an estimated 2,734 indirect discharging job shops and 88 of the 327 indirect independent printed circuit board manufacturers are assumed to incur costs to comply with the TTO standard. Annual costs of $222,500 and $254,300 respectively are projected for the two sectors. The average annual cost per facility to comply with the TTO limitations is approximately $2900, primarily for sampling and analysis. No closures or employment effects are projected for these sectors. Production cost increases are expected not to exceed 0.03 percent for the two sectors.

Non-integrated indirect discharging captive facilities with effluent flows greater then 10,000 gallons per day are assumed to incur additional costs to comply with the TTO standard. Control of metals and cyanide can be achieved through capital investment already required by currently effective electroplating regulations. Although the metals and cyanide standards promulgated today are more stringent than those in the currently effective electroplating regulations, they can be met through use of the same pollution control equipment relied on to meet the electroplating pretreatment standards. The $167,600 of annual costs associated with control of TTO applies to 58 of the 900 nonintegrated captive indirect dischargers with flow greater than 10,000 gpd. No closure or divestitures are expected to occur.

Non-integrated indirect discharging captive facilities with flows less than 10,000 gallons per day will incur costs from both the metals and cyanide standards and the TTO standards. Unlike the prior group with flows greater than 10,000 gpd, this group was generally exempt from Part 413's precipitation/clarification based pretreatment standards. Their inclusion in the metal finishing standard could necessitate investments in both end-of-pipe and in-plant treatment technologies. The cost for these facilities to comply with the metals and cyanide standards totals $11.8 million annually. These costs apply to 912 out of an estimated 2850 nonintegrated indirect discharging captive facilities with flows less than 10,000 gpd. Data indicate that the remainder of these plants already have adequate treatment in place. The annual cost to comply with the TTO standard is $534,600; this applies to 185 facilities. The average increase in the cost of production is approximately one percent. No closure or employment impacts are projected.

Of the 3,750 facilities in the last industry sector, integrated indirect discharging captives, 1,200 may incur aggregate costs of $104 million annually to comply with the metals and cyanide standards and 243 of these facilities may incur costs of approximately $705,000 annually to comply with the TTO standard. Integrated shops perform metal finishing operations in addition to electroplating processes. Thus, they are affected by the existing electroplating standards as well as by today's regulation. EPA anticipates that the integrated facilities will comply with the metal finishing standards by treating their total process discharge through a single treatment system that would be more costly than the one required solely to treat electroplating wastewaters.

The costs indicated above reflect the additional costs of complying with the metal finishing standard; the electroplating costs were reviewed in an earlier regulation 40 CFR Part 413, 44 FR 52590, September 7, 1979 and they serve as the baseline for determining the impacts of the metal finishing regulation. To determine the baseline costs required to comply with the electroplating pretreatment standards, EPA first revised its earlier estimates, based on updated surveys of treatment in place, improved estimates of the population of affected captive shops, and calculated costs attributed to the electroplating flow of integrated captive indirect dischargers. The revised estimate (in 1982 dollars) indicates that this sector's costs for compliance with the electroplating pretreatment standards are $512 million in capital costs and $169 million in annual costs, including interest and depreciation. EPA now estimates that the major economic

effects of that regulation would be 24 plant closures and six electroplating divestitures which could result in 696 job losses and 84 job transfers.

In estimating the economic impact of today's metal finishing regulation, EPA assessed the costs of treating the additional flows covered by today's regulation at the model plants used in the electroplating analysis. The costs used in conducting the economic impact analysis reflect the cost of treating all process flows, expect for the six electroplating process streams specified in Part 413. To the extent these flows include processes not regulated under metal finishing, the costs and resulting impacts overstate the effect of the metal finishing regulation.

EPA's estimates of the effects of these regulations are based on a sample of approximately 1,100 plants. The results have been extrapolated to the full population of 3,750 plants in this sector. For each model plant the analysis determines the incremental increase in the costs of production to comply with the metal finishing standards. If a plant's compliance costs relative to sales are high, the analysis projects metal finishing process line divestitures or plant closures. Additional impacts, thus, are those due to today's metal finishing regulation only. Investment costs are expected to total approximately $351 million, while annual costs are projected to be approximately $118 million, including interest and depreciation. The annual costs represent approximately 0.20 percent of the $60 billion annual value of shipments from integrated indirect captive plants. EPA's analysis projects that this would lead to no plant closures or process line divestitures, and that no employment disruption would result. The TTO portion of these total annual costs shown above is approximately $705,000. TTO costs apply to 243 of the 3750 integrated indirect discharging captive facilities.

Finally, EPA assessed the combined impact of today's regulation and the electroplating pretreatment regulation on the captive integrated indirect discharging sector of the industry. This analysis, like those for electroplating and metal finishing alone, was based on costs for the treatment technology used for the development of the limitations. Some plants may receive removal credits or install less expensive technology. In addition, EPA has deferred the compliance date for integrated facilities, thereby allowing plants additional time to plan for compliance and not be subject to treatment costs. This analysis indicated that the combined investment for the captive integrated indirect discharging sector for both regulations was $827 million, with annual costs of $274 million, including interest and depreciation. Thirty plants (out of 3,750) might divest their electroplating lines or close, and 980 jobs (out of 450,000) could be lost or displaced. These impacts are the same as those due to the electroplating pretreatment standards alone. No additional closures, divestitures, or unemployment effects are expected from the more stringent standards promulgated today.

NSPS and PSNS

Finally, the requirements for new sources are the same as those for existing sources, except that cadmium must be controlled more stringently. The incremental cost of compliance with the cadmium control ranges from $14,000 to $24,000 per facility depending on the water flow. These costs represent between 0.02 and 2.0 percent of projected value of sales for these facilities. Since cadmium plating occurs at only about 15% of the facilities and in-plant controls can be designed into new facilities, there is expected to be no competitive disadvantage for new sources seeking to enter the industry.

Total Toxic Organics

EPA's economic analysis of the TTO limit had its own costing methodolgy. Its results were incorporated into the impact analyses for the other specified limits. EPA believes, however, that a certification procedure will make these costs unnecessary in almost all cases.

The Agency is offering the certification procedure as an alternative to self-monitoring because frequent monitoring for toxic organics could be expensive. Under the certification procedures facilities can identify the toxic organics used and certify that the resultant wastes are being properly disposed, i.e., recovered or contract hauled. The Agency expects that almost all plants will certify.

Some plants may still be required to monitor. However, estimating the number of facilities that may still be required to monitor TTO must be accomplished indirectly, because there is no history to indicate how control authorities will apply toxic organic requirements and certification alternatives to monitoring. The Agency examined two indicators of the need to require monitoring. The first was the percentage of plants that currently dump waste solvent degreasers. This percentage may approximate the population size that control authorities need to check. Only 24% of the captives use solvent degreasing, which is the primary source of potential toxic organic violations in these wastewaters. Comparable figures are 10.3% for job shops and 100% for printed circuit board manufacturers.

These wastes can profitably be recovered by the plant and some waste haulers, who pay for waste solvents, have been identified, and are cited in the public record. Approximately 73% of the facilities which utilize solvent degreasers, already properly dispose of this waste. However even the 27% of the population who now dump their solvents will probably stop that practice and be eligible for certification. In addition some of the solvent degreasers that these plants use do not contain any toxic organics. Other sources of toxic organics present at metal finishing plants may compensate for the Agency's conservative assessment on degreasing but this should not be significant since dumped solvent degreasers are clearly the single most significant source of TTO in wastewaters. Thus this approach leads to a conservative overestimation by the Agency.

The second approach was to examine the percentage of EPA sampled data which exceeded the TTO limit and to consider this as a measure of the fraction of facilities needing monitoring. This was 2.6 percent of the data (i.e., 97.4% of sampled data already complies with the TTO limit). The 2.6 percent exceedance rate of the TTO limit during EPA's sampling supports the need for certification and for control authorities to establish reasoned plant specific monitoring frequencies.

For purposes of economic analyses the number of facilities costed for TTO monitoring was estimated to be equivalent to the number of facilities currently dumping solvents. The economic impact analysis also performed two sensitivity analyses. The first was with a greater number of plants monitoring for TTO. The second assumed that plants monitored for TTO monthly instead of quarterly. Both changes led to only slightly different impacts. All scenarios were found to be acceptable and economically achievable.

Summary

The Agency concludes that the final regulation is economically achievable, and the impacts are justified in light of the effluent reductions achieved. The metal finishing regulation will remove an additional 20 million pounds per year of metals and cyanide and 10 million pounds per year of toxic organics.

B. Executive Order 12291

Under Executive Order 12291 the Agency must determine whether a regulation is "Major" and therefore subject to the requirements of a Regulatory Impact Analysis. Major rules impose an annual cost to the economy of $100 million or more or meet other economic impact criteria. Based on the Agency's estimates this regulation could have an annual effect on the economy of more than $100 million, making it a major regulation.

Executive Order 12291 does not require a Regulatory Impact Analysis where its consideration would conflict with the development of regulations pursuant to a court order, as with this metal finishing regulation. EPA has prepared, however, an analysis that contains many of the elements of a Regulatory Impact Analysis. A copy of the analysis can be obtained from Alec McBride, Monitoring and Data Support Division, WH-553, U.S. EPA, 401 M Street, S.W., Washington, D.C. 20460.

C. Regulatory Flexibility Analysis

Pub. L. 96-354 requires that a Regulatory Flexibility Analysis be prepared for regulations that have a significant impact on a substantial number of small entities. The analysis may be done in conjunction with, or as part of, any other analysis conducted by the Agency.

A small business analysis is included in the economic impact analysis. This analysis shows that there will not be a significant impact on any segment of the industry, large or small. Therefore a formal Regulatory Flexibility Analysis was not required.

D. SBA Loans

The agency is continuing to encourage small plants—including circuit board manufacturers—to use Small Business Administration (SBA) financing as needed for pollution control equipment. The three basic programs are: (1) The Guaranteed Pollution Control Bond Program, (2) the Section 503 Program, and (3) the Regular Guarantee Program. All the SBA loan programs are only open to businesses that have: (a) net assets less than $6 million, and (b) an average annual after-tax income of less than $2 million, and (c) fewer than 250 employees.

For further information and specifics on the Guaranteed Pollution Control Bond Program contact: U.S. Small Business Administration, Office of Pollution Control Financing, 4040 North Fairfax Drive, Rosslyn, Virginia 22203 (703) 235-2902.

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

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

For additional information on the Regular Guarantee and Section 503 Programs contact your district or local SBA Office. The coordinator at EPA headquarters is Ms. Frances Desselle who may be reached at (202) 382-5373.

XIV. Non-Water-Quality Environmental Impacts

The elimination or reduction of one form of pollution may aggravate other environmental problems. Sections 304(b) and 306 of the Act require EPA to consider the non-water-quality environmental impacts (including energy requirements) of certain regulations. To comply, EPA considered the effect of this regulation on air, noise, radiation, and solid waste generation. While balancing pollution problems against each other and against energy use is difficult, EPA believes that the final regulation best serves overall national goals.

The following are the non-water-quality environmental impacts (including energy requirements) associated with today's regulation.

A. Air Pollution

Compliance with the BPT, BAT, NSPS, PSES, and PSNS will not create any substantial air pollution problems. Alkaline chlorination for cyanide destruction and chromium reduction using sulfur dioxide may produce some emissions to the atmosphere. Precipitation and clarification, the major portion of the technology basis, should not result in any air pollution problems. In addition, control of total toxic organics at the source will result in a decrease in the volatilization of solvents from streams and POTWs.

B. Noise

None of the wastewater treatment processes cause significant objectionable noise.

C. Radiation

None of the treatment processes pose any radiation hazards.

D. Solid Waste

EPA has considered the effect these regulations would have on the accumulation of hazardous waste, as defined under Section 3001 of the Resource Conservation and Recovery Act (RCRA). EPA estimates that the BPT and BAT limitations will not contribute to additional solid or hazardous wastes. However, PSES will increase the solid wastes from these plants by approximately 165,000 metric tons per year. This sludge can be hazardous because it will necessarily contain additional quantities (and concentrations) of toxic metal pollutants. Disposal of these wastes was costed as though they were hazardous.

EPA's Office of Solid Waste has analyzed the solid waste management and disposal costs required by the industry's compliance with RCRA requirements. Some results were published in 45 FR 33066 (May 19, 1980). In addition, RCRA costs have been included in the costs and economic impact analysis during the development of this regulation. However, since November 1980, EPA has received 196 petitions to delist wastes from metal finishing facilities. Seventy-seven have been granted, 104 are pending and 15 have been rejected. Thus it appears that the decision to cost all solid waste disposal as hazardous probably overstated likely costs. Furthermore, the Agency has not assessed the savings likely to occur because of reduced contamination of POTW sludges. Those savings are likely to be considerable.

E. Energy Requirements

EPA estimates that achieving the BPT and BAT effluent limitations will not increase electrical energy consumption.

The Agency estimates that PSES will increase electrical energy consumption by approximately 142 million kilowatt-hours per year. For a typical existing indirect discharger, this will increase energy consumption less than one percent of the total energy consumed for production.

The energy requirements for NSPS and PSNS are estimated to be similar to energy requirement for BAT. However, this can only be quantified in kwh/year after projections are made for new plant construction.

XV. Best Management Practices (BMPs)

Section 304(e) of the Clean Water Act authorizes the Administrator to prescribe "best management practices" ("BMPs"). EPA may develop BMPs that apply to all industrial sites or to a designated industrial category, and may offer guidance to permit authorities in

establishing management practices required by unique circumstances at a given plant.

Although EPA is not prescribing them at this time, future BMPs could require dikes, curbs, or other measures to contain leaks and spills, and could require the treatment of toxic pollutants in these wastes.

XVI. Upset and Bypass Provisions

A recurring issue is whether industry limitations and standards should include provisions that authorize noncompliance during "upset" 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 regulations include upset and bypass permit provisions. See 40 CFR Part 122.41, 48 FR 14151, 14168 (April 1, 1983). 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 metal finishing industry are entitled to the upset and bypass provisions in NPDES permits, this regulation need not repeat these provisions. Upset provisions are also contained in the general pretreatment regulation.

XVII. Variances and Modifications

Federal and State NPDES permits to direct dischargers must enforce these effluent standards. 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. Although this variance clause was set forth in EPA's 1973–1976 industry regulations, it need not be included 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. 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. According to Section 301(j)(1)(B), applications for these modifications must be filed within 270 days after promulgation of final effluent limitations and standards. See 43 FR 40859 (Sept. 13, 1978). These Part 413 and Part 433 regulations do not regulate any non-conventional, non-toxic, pollutants. If any of the regulated pollutants are declared non-toxic, and non-conventional in the future, then dischargers may seek 301(c) or 301(g) modifications.

Indirect dischargers subject to PSES are eligible for the "fundamentally different factors" variance and for credits for toxic pollutants removed by POTW. 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*.

XVIII. Implementation of Limitations and Standards

A. Relation to NPDES Permits.

The BPT, BAT, and NSPS in this regulation will be applied to individual metal finishing plants through NPDES permits issued by EPA or approved State agencies under Section 402 of the Act. The preceding section of this preamble discussed the binding effect of this regulation on NPDES permits, except when variances and modifications are expressly authorized. This section adds more detail on the relation between this regulation and 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.

B. Indirect Dischargers

For indirect dischargers, PSES and PSNS are implemented under National Pretreatment Program procedures outlined in 40 CFR Part 403. The table below may be of assistance in resolving questions about the operation of that program. A brief explanation of some of the submissions indicated on the table follows:

A "request for category determination request" is a written request, submitted by an indirect discharger or its POTW, for a certification on whether the indirect discharger falls within a particular subcategory listed in a categorical pretreatment standard. This assists the indirect discharger in knowing just which PSES or PSNS limits it will be required to meet. See 40 CFR 403.6(a).

A "request for fundamentally different factors variance" is a mechanism by which a categorical pretreatment standard may be adjusted, making it more or less stringent, on a case-by-case basis. If an indirect discharger, a POTW, or any interested person believes that factors relating to specific indirect discharger are fundamentally different from those factors considered during development of the relevant categorical pretreatment standard and that the existence of those factors justifies a different discharge limit from that specified in the categorical standard, then they may submit a request to EPA for such a variance. See 40 CFR 403.13.

A "baseline monitoring report" is the first report an indirect discharger must file following promulgation of a standard applicable to it. The baseline report includes: an indentification of the indirect discharger; a description of its operations; a report on the flows of regulated streams and the results of sampling analyses to determine levels of regulated pollutants in those streams; a statement of the discharger's compliance or noncompliance with the standard; and a description of any additional steps required to achieve compliance. See 40 CFR 403.12(b)

A "report on compliance" is required of each indirect discharger within 90 days following the date for compliance with an applicable categorical pretreatment standard. The report must indicate the nature and concentration of all regulated pollutants in the facility's regulated process wastestreams; the average and maximum daily flows of the regulated streams; and a statement of whether compliance is consistently being achieved, and if not, what additional operation and maintenance and/or pretreatment is necessary to achieve compliance. See 40 CFR 403.12(d)

A "periodic compliance report" is a report on continuing compliance with all applicable categorical pretreatment standards. It is submitted twice per year (June and December) by indirect dischargers subject to the standards. The report shall indicate the precise nature and concentrations of the regulated pollutants in its discharge to the POTW; the average and maximum daily flow rates of the facility; the methods used by the indirect discharger to sample and analyze the data, and a certification that these methods conformed to those methods outlined in the regulations. See 40 CFR 403.12(e)

TABLE 2.—INDIRECT DISCHARGERS SCHEDULE FOR SUBMITTAL AND COMPLIANCE

Item/event	Applicable sources	Date or time period	Measured from	Item submitted to
Request for category determination.	Existing	60 days	From effective date of standard.	Director.[1]
		or 60 days	From FEDERAL REGISTER Development Document Availability.	
	New	Prior to commencement of discharge to POTW.		
Request for fundamentally different factors variance.	All	180 days	From effective date of standard.	Director.[1]
		or 30 days	From final decision on category determination.	
Baseline monitoring report	All	180 days	From effective date of standard or final decision on category determination.	Control authority.[2]
Report on compliance	Existing	90 days	From date for final compliance.	Control authority.[2]
	New	90 days	From commencement of discharge to POTW.	
Periodic Compliance Reports	All	June and December.		Control authority.[2]

[1] Director = a) Chief Administrative Officer of a State water pollution control agency with an approved pretreatment program or b) EPA Regional Water Division Director, if State does not have an approved pretreatment program.
[2] Control Authority = a) POTW if its pretreatment program has been approved or b) Director of State water pollution control agency with an approved pretreatment program or c) EPA Regional Administrator, if State does not have an approved pretreatment program.

C. Applicability and Compliance Dates

In the electroplating/metal finishing industry some facilities are subject to the Electroplating Category (Part 413) and/or the Metal Finishing Category (Part 433). Table 3 below illustrates which of the regulations are applicable to the various types of facilities. Facilities are subject only to Part 433 (metal finishing) for BPT, BAT, NSPS, and PSNS. For PSES, facilities generally fall within the applicability of both Parts, although, for each pollutant, only one Part will apply at a given time. There are two exceptions: (1) Existing indirect discharging job shops and IPCBMs have been exempted from the Part 433 Metal Finishing PSES, and (2) metal finishing wastewaters at iron and steel mills are exempted from the Part 413 Electroplating PSES.

TABLE 3.—APPLICABILITY

	Job shops	IPCBM	Captives	Metal finishing at iron and steel mills[1]
PSES:				
Electroplating (Part 413)	x	x	x	
Metal Finishing (Part 433)			x	x
BPT, BAT, NSPS, PSNS:				
Metal Finishing	x	x	x	x

[1] Electroplating process wastewater at iron and steel mills was excluded from the Electroplating PSES by 40 CFR 413.01. Flows from the metal finishing processes at those plants are covered by 40 CFR 433.

The compliance dates for the two categories are presented in Table 4. BPT, BAT, PSNS, and NSPS compliance dates are specified by the Clean Water Act. The compliance dates for Electroplating PSES were set in the Federal Register on September 28, 1982. See 47 FR 42698. Today's regulation allows facilities 3 years to comply with the Electroplating PSES for toxic organics consistent with the Settlement Agreement with NAMF. For metal finishing, the Agency is allowing 31 months for compliance with all parameters. In addition an interim TTO limit has been established for compliance by June 30, 1984; except for metal finishing wastewaters from plants which are also subject to Part 420 (iron and steel), which must comply by July 10, 1985. This last exception is pursuant to a settlement agreement with the steel industry in which EPA agreed that pretreatment requirements would apply to steel discharges in July 1985. It is possible that control of TTO in metal finishing waste streams could, in some cases, lead steel facilities to install treatment technology on the discharge from their steel processes. Therefore, EPA has decided to allow plants covered by Part 420 until June, 1985 to comply with the TTO limit.

TABLE 4.—COMPLIANCE DATES

Regulation	Compliance date
Electroplating PSES for	April 27, 1984 (for nonintegrated plants).
Metals and Cyanide (Part 413).	June 30, 1984 (for integrated plants).
Electroplating PSES (Part 413) for TTO.[2].	July 15, 1986
Metal Finishing BPT (Part 433).	As soon as possible
Metal Finishing BAT	July 1, 1984.
Metal Finishing PSES for TTO [1].	June 30, 1984 (except for plants covered by Part 420); July 10, 1985 (for plants covered by Part 420).
Metal Finishing PSES for Metals, Cyanide and TTO.[2].	February 15, 1986.
Metal Finishing NSPS and PSNS.	From commencement of discharge.

[1] For these facilities the first TTO limit is based on management practices only.
[2] This TTO limit is based on management practices followed by percipitation/clarification.

D. Enforcement

A final topic of concern is the operation of EPA's enforcement program. This was an important consideration in developing this regulation. EPA deliberately sought to avoid standards which would be exceeded by routine fluctuations of well-designed and operated treatment systems. These standards were developed so as to represent limits which such a plant would meet approximately 99% of the time.

The Clean Water Act is a strict liability statute. EPA emphasizes, however, that it can exercise discretion in deciding to initiate enforcement proceedings (*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.

XIX. Summary of Public Participation

At the time of publication of the proposed metal finishing regulation (August 31, 1982), EPA solicited comments on the proposed rules and, in particular, on six specific issues. Ninety-one commenters responded to these and other issues relating to the electroplating and metal finishing standards. The following parties submitted comments:

Air Transport Association of America
Alpha Industries Inc.
The Aluminum Association Incorporated
American Airlines
American Foundrymen's Society
American Hot Dip Galvanizers
American Metal Stamping Association
Anerock Corporation
Anaconda Aluminum Company
Ansul Fire Protection
Apollo Metals, Inc.
American Telephone and Telegraph Company
Atwood
Babcock and Wilcox
Bausch and Lomb
California Metal Enameling Co.
Caterpillar Tractor Company
Charles A. Frawley
Chrysler Corp.
Control Data Corporation
County Sanitation Districts of Los Angeles County
Cumberland Corporation
D.A.B. Industries, Inc.
Deere and Company
Delta Airlines, Inc.
Department of the Air Force
Eaton Corporation
E. I. DuPont de Nemours and Co.
Eltech Systems Corp.
EMP Laboratories, Incorporated
EPA Region V
ERC-Lancy
Federal-Mogul Corporation
Ferro Corporation
Ford Motor Co.
General Electric Company
General Motors Corporation
Goodyear Aerospace Corporation
Goodyear Tire and Rubber Co.
Gould Electronics and Electrical Products
GTE Services Corporation
GWS Technology, Inc.
Harris Corporation
Harvey Hubbell Incorporated
Hofmann Industries Incorporated
Honeywell
Halogenated Solvent Industry Alliance
Huntington Alloys
Imperial Clevite, Inc.
Institute for Interconnecting and Packaging Electronic Circuits
ITT Telecommunications Corporation
Jenn-Air Corporation
Jayto Corporation
Kaiser Aluminum and Chemical Corporation
Masco Corporation
Manufacturing Association of Central New York
Maytag
Metal Finishing Association of Southern California
Metro Municipality of Metropolitan Seattle
Midland Ross Corporation
Milwaukee Metropolitan Sewerage District
3M Company
Mobay Chemical Corporation
Modine Manufacturing Company
National Association of Metal Finishers
National Electrical Manufacturers' Association
New York State Department of Environmental Conservation
Northern Telecom
Ozark Airlines
PCK Technology Division
PEC Industries
Pioneer Metal Finishing, Inc.
Porcelain Enamel Institute
Porcelain Metals Corporation
Praegitzer Industries Inc.
Raytheon Company
Republic Airlines
Rexnord
Reynolds Aluminum
Rockford Area Chambers of Commerce
R.R. Donnelley and Sons
Sanders Associates Inc.
Sanitary District of Rockford
Sperry Corporation
Square D Company
State of Connecticut Department of Environmental Protection
State of Vermont Agency of Environmental Conservation
State of Wisconsin Department of Natural Resources
United Airlines

Whirlpool Corporation
York Metal Finishing Co.

The major issues raised by commenters are addressed in this section. A summary of all comments received and of our responses is included in the public record for this regulation.

1. Comment: Many commenters objected to the certification language EPA proposed as an alternative to TTO Monitoring. 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.

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. This language is substantially similar to that now available for the electrical and electronics industry (Phase I). *See* 48 *FR* 15382, April 8, 1983.

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 toxic organic 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 toxic organic 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 toxic organic 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 toxic organic 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 because 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.

Addition of certification language is intended to reduce monitoring burdens. It does not in any way dimish the discharger's liability for noncompliance with the TTO limitation.

2. Comment: Several commenters questioned EPA's estimate of minimal costs for TTO control stating that signficant costs would be incurred from solvent disposal and from compliance monitoring. A number of commenters questioned the statement that costs for solvent disposal could be offset by reclamation of these wastes.

Response: The Agency recognizes that costs can be associated with proper solvent management and compliance monitoring. However, the Agency does not believe these costs will be significant for the majority of the facilities in the industry. 24% of the captives, 10.3% of the job shops and 100% of the printed circuit board facilities perform solvent degreasing. An estimated 73 percent of the facilities using solvent degreasing are already practicing proper disposal of these wastes and would, therefore, not be expected to incur additional costs to comply with the electroplating or metal finishing TTO limits. Facilities not presently practicing proper solvent management would need to implement practices such as contractor removal and/or reclamation.

Costs of proper solvent disposal can be offset by solvent reclamation. In response to comments, the Agency contacted representatives of national solvent reclamation associations. These representatives indicated that solvent reclamation is a widespread, readily available, and growing practice. In addition to the numerous plants with on-site reclamation facilities, it is estimated that more than 100 independent reclaimers are in operation throughout the country and that reclaimers will pay for spent solvents especially if the solvents are segregated and there is a market demand for the particular solvents.

The Agency recognizes that frequent monitoring for TTO can be expensive. The Agency has attempted to reduce the cost by establishing the certification alternative and by allowing monitoring, when necessary, to be limited to those toxic organics likely to be present in the wastewater of a plant. The Agency believes that almost all facilities will be able to certify in lieu of monitoring. However, in response to comments on the cost of compliance monitoring, the Agency has re-assessed its cost estimate to consider quarterly monitoring for TTO. This frequency is reflective of a common monitoring frequency required by control authorities. For the reasons explained in section IX, above, EPA believes that its economic analyses of the impacts of the TTO limit are conservative and fully state or overstate the likely actual economic impacts.

3. Comment: Some commenters pointed out that the new source limits for cadmium were not supported by historical performance data. However, no commenters submitted data on performance capabilities of new source technology.

Response: New source standards for cadmium are based on control technology which is designed to reduce cadmium in wastewater discharge from cadmium sources, e.g. cadmium plating, chromating of cadmium plated parts, and acid cleaning of cadmium plated parts. The new source standards for cadmium are based on the amounts of cadmium expected as a background level to be found in wastewaters from plants not involved with cadmium plating. The standards were determined from data on concentrations observed in untreated wastewater from metal finishing plants that do not plate cadmium. It represents the amount of cadmium present from incidental sources, when the principal cadmium sources are full controlled. The data consist of 61 observations from 27 plants. The data were divided into statistically homogeneous groups by plant. The average upon which the standards were based was taken from the group with the highest average cadmium concentration. Estimates of

variability used in determining the limits were obtained from the two highest groups. This was somewhat conservative, because precipitation/clarification systems should achieve significant further removals from these raw waste streams.

The Agency also checked the consistency of the limit with data from EPA sampled precipitation/clarification systems. These data indicated that the new source limit could be achieved alternatively by using precipitation/clarification, rather than total control of the principal cadmium source. This review included plants with cadmium raw wastes of from 0.012 to 1.88 mg/l. The Agency also reviewed the data base used to develop the cadmium limit to verify that it included all available data from non-cadmium plating plants. Prior to promulgation costs were also re-examined to include expenses for control of chromating and acid cleaning of cadmium plated parts, in addition to controlling cadmium plating which was assessed in the proposal.

4. Comment: Commenters suggested various averaging times as the basis for monthly limitations, including 4-day, 30-day, and "N" day averages.

Response: The Agency has evaluated the merits of the suggested alternatives and decided that an average of ten samples (obtained within a one-month period) would provide a reasonable basis for monthly limitations, minimizing the number of samples necessary.

Although it is not anticipated that a monitoring frequency of 10 times per month will always be required, the cost of this frequency of monitoring is presented in the economic impact analysis to the metal finishing regulation. That frequency was selected because if facilities sample 10 times per month they can expect a compliance rate of approximately 99 percent, if they are operating at the expected mean and variability. Plant personnel, in agreement with the control authority, may choose to take fewer samples if their treatment system achieves better long term concentrations or lower variability than the basis for the limits, or if plant personnel are willing to accept a statistical possibility of increased violations. The 10 sample monthly limit is consistent with other regulations and recent proposals for other metals industries, e.g., porcelain enameling, coil coating, batteries, copper, and aluminum forming.

The 4-day average is an inadequate measure of treatment system performance over extended periods. This basis was used for the electroplating rules only under the special circumstances of a Settlement Agreement.

The N-day average suggested by two commenters was considered by the Agency but was rejected as unnecessarily complex and likely to create confusion for both dischargers and control authorities.

5. Comment: Commenters disagreed on the desirability or need to rescind the electroplating regulations for captive electroplaters upon the compliance date of the metal finishing PSES.

Response: The Part 413 Electroplating PSES will no longer be applicable to captive electroplating when they must comply with the Metal Finishing PSES for metals and cyanide is reached. Captive electroplaters will then be regulated under the Part 433 Metal Finishing PSES. There is no need to maintain two sets of requirements for the same pollutants at the same plants. If, for some reason, Part 433 should become inapplicable, then Part 413 will apply to them.

6. Comment: The majority of commenters responding to the question of the PSES compliance date stated that March 30, 1984 would not provide sufficient time for compliance.

Response: To allow facilities sufficient time to install or upgrade the necessary treatment systems, the Agency is establishing the compliance date of the metal finishing PSES for metals and cyanide to be 31 months from the date of promulgation. This extension is based on an Agency study which showed that 31 months is required to plan, design, and install the recommended treatment technology.

This extension does not apply to compliance with the toxic organics limit, however. For Metal Finishing PSES, an interim TTO level must be achieved by June 30, 1984, based on no end-of-pipe treatment, and the final TTO limit based on end-of-pipe treatment must be achieved 31 months from the date of promulgation. For Electroplating PSES, the TTO compliance date is 3 years from promulgation of this rulemaking. That allows the job shop and IPCBM sectors the maximum allowable time for compliance under the Clean Water Act (CWA).

7. Comment: Commenters stated that the proposed lead limit was not achievable based on the technology recommended. Some argued that plants with high raw waste lead values were not adequately represented in the data base. One commenter submitted additional data.

Response: The Agency reviewed the lead data base to assure that all usable data from plants having a lead source were included. EPA did consider some additional self-monitoring data that were found to be applicable and excluded data from an originally-considered plant which was not adequately controlling wastewaters. The revised EPA data base was used to derive a final lead limit. The daily maximum for lead has been changed slightly from 0.67 mg/l to 0.69 mg/l. The Agency also examined data submitted during the comment period. These data were not included because of inadequate treatment design and/or operation. For example, TSS values as high as 119 mg/l were submitted, oil and grease was as high as 1395 mg/l and hexavalent chromium was as high as 1.21 mg/l. An examination of the possible effect of including the commenter's data for lead revealed that only a slight change in the limit would have occurred.

8. Comment: Some commenters suggested a small plant exemption from the Metal Finishing regulations, arguing that an exemption should be granted similar to that provided by Part 413 for plants discharging less than 10,000 gallons per day.

Response: Small indirect discharging facilities (<10,000 GPD discharge) were given less stringent requirements in the Electroplating Pretreatment Standards. Many of these facilities are job shops and for the reasons stated above will not be covered by the Part 433 requirements.

The Agency re-examined the effect of the Part 433 metal finishing regulations on small facilities, and, has determined that because job shops and IPCBMs are exempted from the metal finishing PSES there would be no significant economic impacts if the remainder were covered by the metal finishing standards. For indirect captives discharging less than 10,000 GPD, the investment cost would amount to $36 million with annual costs of $12 million. There are no estimated plant closure or divestitures. A small facility exemption is not warranted for the Metal Finishing regulation.

9. Comment: Some commenters stated that the addition of a TTO limit to the Electroplating PSES is a violation of the NAMF Settlement Agreement.

Response: Under the March 1980 Settlement Agreement the Agency agreed that:

> any further BAT analog standards will be based on treatment technology compatible with the model technology upon which these standards were based . . . . In developing BAT analog standards for the industry, EPA will take into account the cumulative impact of these "BPT" regulations in determining what is "economically achievable." * * * As to this segment of the metal finishing industry

that is economically vulnerable, EPA does not believe that more stringent regulations are now economically achievable. Therefore, EPA does not plan to develop more stringent new pretreament standards for the job shop metal finishing segment in the next several years. Nor does EPA plan to develop in the next several years more stringent standards for the independent printed circuit board segment where significant economic vulnerability also exists.

EPA is not imposing metals and cyanide limitations more stringent than those specified in the Part 413 existing applicable pretreatment standards, despite evidence that such limits can be reliably achieved by the technology that forms the basis of the current standards.

Indirect discharging job shop and independent printed circuit board facilities are expected to incur costs only to comply with the TTO limitation which is being added to the electroplating pretreatment standards in Part 413. This TTO limitation is included in the regulation because it will substantially reduce a significant toxic problem, while compliance will cause negligible economic impacts on these industry sectors. Compliance with the toxic organic standard can be achieved by good management practices (i.e., not dumping waste solvents into the wastewaters). No additional end-of-pipe technology (beyond that required for metals removed) is necessary.

Even under very conservative estimates only 77 of an estimated 2734 indirect discharging job shops and 88 of the 327 indirect independent printed circuit board manufacturers may incur costs to comply with the TTO standard. Total annual costs for all plants of $222,500 and $254,300 respectively are projected for the two sectors. The average annual cost per facility to comply with the TTO limitations is approximately $2900, primarily for sampling and analysis. No closures or employment effects are projected for these sectors. Production cost increases are expected not to exceed 0.03 percent for the two sectors.

The economic impact analysis also performed two sensitivity analyses: the first with a greater number of plants monitoring and, the second, with plants monitoring monthly instead of quarterly. Both changes led to only slightly different impacts. At most only one plant would be affected. All scenarios were found to be acceptable and economically achievable. Thus the TTO limits are not "more stringent standards" in the sense of the Settlement Agreement, which expressly tied "stringency" to "economic vulnerability".

Finally, the TTO limits need not be complied with before 1986. Thus, even if control of TTO were considered significantly more stringent the time allowed for compliance will amount to 6 years from the date of the Settlement Agreement. That fulfills the Agency's 1980 obligation not to develop significantly more stringent standards for those facilities for the next several years.

10. Comment: Some commenters stated that the proposed TTO limit could not be met using a combination of solvent management and common metals treatment. Several commenters also pointed out that plants previously in compliance with the metals limitations under Electroplating PSES may now require installation of common metals treatment to meet the TTO limit.

Response: The Agency has reviewed the TTO data base, reevaluated the mean and variability factor, and revised the effluent limit for TTO. The major factor contributing to the change was the examination of the TTO levels at certain groupings of plants. The most notable discovery was that plants that performed both solvent degreasing and painting tended to have the highest background concentrations of any process grouping. The limit has been based on these plants. Where plants are otherwise subject to a regulation whose technology basis includes precipitation/clarification for removal of metals, the TTO limit has been based on effluent data from precipitation/clarification treatment systems. We have also established a TTO limit of 4.57 mg/l based on only management practices. This limit is being used as an interim requirement prior to installation of pollution/equivalent to precipitation/clarification, and for plants discharging less then 10,000 gpd and now covered by the Part 413 Electroplating PSES. Thus today's regulation specifies an interim TTO limit for small plants (<10,000 gallons per day) because these plants may not already have common metals treatment in place. Furthermore, the Agency notes that most facilities should be capable of achieving compliance with the ultimate TTO standard even without end-of-pipe treatment, simply through strict management control of toxic organics. 89% of the TTO data *prior* to end-of-pipe treatment would comply with the final TTO limit based on the inclusion of precipitation/clarification.

11. Comment: Several commenters recommended an amenable cyanide limit as an alternative to a total cyanide limit because amenable cyanide more accurately reflects the performance of alkaline chlorination treatment.

Response: Most facilities should be able to meet the total cyanide limit. However, sufficient information has been presented on cyanide formulations and formation of complexes to support the possibility that a significant population could fail to meet the limitations. The technology basis is alkaline chlorination which destroys amenable cyanides. Thus, the final rules include an alternative cyanide limit for plants generating significant quantities of complexed cyanide. The data and basic calculations for the alternative cyanide limit were presented in the proposed development document. The Agency rejected specifying a limit only for amenable cyanide. While complexed cyanide are substantially less toxic, a review of literature indicates that significant transformatioin of complexed cyanides into amenable cyanides will occur in the aquatic environment due to the presence of sunlight. If any water quality problems occur due to the use of this alternative, the control authority should examine alternative technologies, i.e., precipitation with ferrous sulfate

12. Comment: Several commenters suggested that fluoride, iron, and hexavalent chromium be regulated.

Response: The Agency did not establish limitations for fluorides, iron, or hexavalent chromium because it was determined that these parameters were (1) not present in sufficiently high quantities to warrant regulation or (2) would be removed by controlling a regulated parameter.

The historical performance data for flouride in effluent from plants with Option 1 treatment systems shows that the mean concentration was 6.58 mg/l: well below levels required by categorical regulations for other industries, i.e., inorganic chemicals, and electrical and electronic components (phase I).

Iron was not selected for regulation because it would be substantially reduced during proper precipitation/clarification treatment. Thus control of regulated pollutants will also effect control of iron.

A limit was not established for hexavalent chromium because it will be controlled by regulating total chromium. The technology basis does include the cost for hexavalent chromium stream segregation and reduction. As stated in the development document, chemical hexavalent chromium reduction can readily achieve final hexavalent chromium concentrations of 0.16 mg/l for a daily maximum and 0.10 mg/l for a maximum monthly average. Additionally, monitoring for total

chromium has a distinct cost advantage over monitoring for hexavalent and subsequently trivalent chromium. If any of these or other parameters cause problems with achieving local water quality requirements, then the control authority must specify further requirements on a plant-by-plant basis.

13. Comment: Several commenters stated that EPA's method for distributing costs for indirect dischargers between the Part 413 electroplating and the Part 433 metal finishing regulations is misleading and unrealistic. Electroplating compliance costs for captive indirect dischargers have not yet been incurred. When these plants do comply, it will be with both regulations in a one-time investment. Therefore, no costs should be attributed to Electroplating; rather, all costs should be considered as Metal Finishing compliance costs.

Response: The fact that a company may make a one time investment doesn't necessarily mean that all the costs should be attributed to the Part 433 Metal Finishing Standard. The compliance date for Part 433 is now generally two years after compliance is required by Part 413.

When EPA conducts its economic analysis of a guideline, it identifies the incremental costs and impacts, as well as the incremental pollutant removals, of that particular guideline. If other previously promulgated regulations pertain to the same industry, the costs and associated pollutant removals would have been identified in previous economic and environmental analyses. With the metal finishing regulation, the electroplating costs are baseline costs; the will occur even if metal finishing is not promulgated. Costs and impacts of metal finishing are incremental to electroplating; the effect of electroplating isn't negated or obviated because it may be more efficient for plants to make a one time investment.

For non-integrated captive indirect dischargers (more than 10,000 gallons per day), this incremental investment cost is zero. Non-integrated facilities discharge process wastewaters from electroplating operations only. Although these wastewaters are covered by metal finishing standards which are more stringent than electroplating standards, the treatment system installed to meet the electroplating standards will be sufficient to meet the metal finishing limits. This treatment system will be the same whether or not metal finishing is promulgated. The costs associated with installation of this treatment system have already been included in the electroplating analysis and there is no need to include them in the metal finishing regulatory costs.

For integrated captive indirect dischargers, the incremental investment cost is not zero. Integrated facilities discharge wastewaters from other types of processes in addition to electroplating. Although the facility may segregate its electroplating effluent stream for treatment, it is usually more economical to combine waste streams and build a single treatment facility. This treatment facility will be larger than the facility which would have been constructed to treat a segregated electroplating effluent stream alone. The costs assigned to metal finishing are those incremental costs over and above the amount that would have been spent for treatment of the segregated electroplating effluent stream.

Finally, as noted above, EPA did assess the combined inpact of today's regulation and the electroplating pretreatment regulations on the captive integrated indirect discharging sector of the industry, assuming both costs would be borne at the same time. The impacts are the same as those due to the electroplating pretreatment standards alone. No additional closures, divestitures, or unemployment effects are expected from the more stringent standards promulgated today.

14. Comment: Several commenters stated that the Agency should do a Regulatory Impact Analysis as required by Executive Order 12291.

Response: Executive Order 12291 does not require a Regulatory Impact Analysis where its consideration would conflict with the development of regulations pursuant to a court order, as with this metal finishing regulation. EPA has prepared, however, an analysis that contains many of the elements of a Regulatory Impact Analysis. This report is included in the public record for this regulation.

15. Comment: Several commenters stated that the Metal Finishing Guidelines are not economically achievable.

Response: EPA's *Economic Analysis of Proposed Effluent Standards and Limitations for the Metal Finishing Industry* provides an in-depth analysis of the economic impacts of the proposed guidelines. This analysis considers the compliance costs (both capital and annual) for two regulatory options. The economic impacts in terms of plant closures, process divestitures, employment losses, and cost increases are also presented for both options. Analysis results are presented for each segment of the industry that is being regulated: direct discharging job shops and captives, indirect discharging job shops and captives, and integrated printed circuit board manufactures.

Results for Option I, the selected option, are summarized on Exhibit I-4 and I-5 of the referenced report. The direct discharging segment (both job shops and captives) will incur costs to comply with the TTO limitation only. Indirect discharging job shops and independent printed circuit boards also will incur costs to comply with the TTO standard only. Annual compliance costs at these facilities are less than $2,900. No closures or employment effects are projected. Indirect discharging captives will incur a total of $116 million in annual compliance costs. The analysis indicates that this segment is composed primarily of large plants, many of which are members of diversified industrial corporations. As a result, there are no projected impacts among captive plants. The costs of production for indirect discharging captives are projected to increase from 0.2 to 1.0 percent.

The absence of closure or employment effects combined with a small increase in the cost of production ranging from 0.2 to 1.0 percent for all plants covered by the metal finishing regulation indicate that the guidelines are economically achievable.

16. Comment: Commenters questioned the assumption that captive operations have no capital availability problem They say that the economic conditions have changed and capital availability could indeed be a problem.

Response: Changes in the availability of capital are reflected in the cost of capital. To reflect the increase in the cost of capital, EPA adjusted its nominal cost of capital assumption in the Economic Impact Analysis to 13 percent from the 10 percent cost of capital used in the proposed regulation. To the extent that an increase in the cost of capital is a problem today for metal finishers, it would show up in the impact analysis conducted under the higher cost of capital. No changes in closures or divestitures resulted from the increased cost of capital assumption.

17 Comment: Several commenters stated that EPA did not properly consider the impact on small businesses, specifically the costs of compliance and resultant economic impacts for captive indirect dischargers whose electroplating process flow is less than 10,000 gpd. EPA implicitly assumed that all of these plants are in compliance with the Electroplating Pretreatment Standards, but in fact these Standards exempted plants from compliance whose flow were less than 10,000 gpd Therefore, they will incur costs and

economic impacts to comply with Metal Finishing Guidelines.

Response: The commenters are correct. The agency has since analyzed the impact on indirect discharging captives with metal finishing process flows of less than 10,000 gpd. The analysis concluded that a total of 912 plants will incur compliance costs. The total capital cost of compliance for this universe is estimated at $35 million with annual costs of $12 million. No closures or employment effects are projected for this industry segment.

18. Comment: Commenters questioned the assumption that the metal finishing demand curve is inelastic.

Response: Metal finished products face a wide range of demand elasticities. However, there are no good substitutes for metal finishing due to the quality it imparts on materials. As a result, an increase in the cost of metal finishing will not bring a more than proportional decrease in the use of metal finishing. The analysis assumed that demand for metal finishing is in the inelastic range but did not assume that all cost increases could be passed through. In fact, the captive closure analysis assumes that a plant's captive operations will not be able to pass through a pollution control cost increase if it amounts to more than 5 percent of their total revenue. If the ratio of annual costs to total revenue was larger than 5 percent, the plant was projected to close.

19. Comment: Commenters stated that they thought captive facitities will be at a competitive disadvantage because job shops are exempted from metal finishing standards.

Response: Captives are very rarely in direct competition with job shops, vying for the same customers. Captive platers, by definition, service their own firm's needs. A captive firm will maintain a plating process for its cost advantages, scheduling control, and specialty processes. In the Agency's survey of captive facilities, over 64 percent indicated they performed metal finishing in-house because it was either less expensive to do so or the work flow didn't allow interruption of work. It is true that job shops will often receive a captive's overflow work, but this does not make them price competitors. Also, almost three-fourths of the indirect discharging captive facilities and all direct discharging captives and job shops already have treatment in place. To the extent there may be changes in the competitive position of captives versus job shops, most of these changes would have occurred already. Finally, indirect discharging job shops were exempted from the metal finishing regulation specifically because of their economic vulnerability. Job shops tend to be much smaller than captives; they average 26 employees and $1.3 million in sales versus over 100 employees and $14 million in sales for captives.

20. Comment: A comment was made that the definition of a job shop may force some "job shops" to be classified as captives.

Response: EPA proposed a definition of job shops based on 50% ownership of treated material. This is in accord with existing practice by an overwhelming portion of the affected industry. An examination of the survey of job shops revealed that 95% of the facilities stated that their work was either 100% job ordered or 100% captive. Only 0.26% of the facilities reported that more than 25%, but less than 50%, of their production was done on materials owned by others.

The final definition of a job shop has been modified slightly, making the measurement of "not more than 50% ownership" on a yearly basis. This responds to a commenters' fear of repeated reclassification as a result of business transactions. Now facilities will not be reclassified on a day-to-day basis.

The definition is also appropriate because, the fact that a facility is purchasing materials to be processed indicates some availability of capital. If so the less stringent Part 413 requirements are less appropriate for economic reasons.

The agency considered various job shop definitions from commentors and trade association by-laws, including:

- "As its major operation the application of a surface treatment to the products of others."
- "A shop which has purchased orders from more than 50 percent of the materials in process."
- "Parts to be finished are transported from the customer's plant to the finishers and then back."
- "As its major operation the application of a surface treatment to the products of others."
- "A metal finisher who works to other's specifications, making his services, available to the public at all times."

While some of these, notably the first, are close to the proposed and final definitions, all suggestions included substantial ambiguity. In light of the relaxed standards for job shops it is important that the definition be precise and that captive shops not evade Part 433 merely by taking on nominal outside orders. EPA therefore chose a bright-line test that clearly expressed the overwhelmingly prevailing practice in the industry.

EPA's definition is consistent with our 1978 survey of the industry, which asked for the "percent of electroplating done on materials owned by others (basis area plated)" and further defined a job shop as "a manufacturing operation performing work on materials owned by others."

XX. 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 Metal Finishing Point Source Category.* The Agency's economic analysis is presented in *Economic Impact Analysis of Effluent Limitations and Standards for the Metal Finishing Industry.* A summary of the public comments received on the proposed regulation is presented in a report "Responses to Public Comments, Proposed Metal Finishing Effluent Guidelines and Standards," which is part of the public record for this regulation.

Technical information may be obtained by writing to Richard Kinch, Effluent Guidelines Division (WH-552) EPA, 401 M Street, S.W., Washington, D.C. 20460 or by calling (202) 382-7159.

Additional information concerning the economic impact analysis may be obtained from Ms. Kathleen Ehrensberger, Economics Branch (WH-586), EPA, 401 M Street, S.W., Washington, D.C. 20460 or by calling (202) 382-5397.

Copies of the technical and economic documents will be available from the National Technical Information Service, Springfield, Virginia 22161, (703) 487-4650.

XXI. OMB Review

This regulation was submitted to the Office of Management and Budget for review, as required by Executive Order 12291. No written comments were received.

In accordance with the Paperwork Reduction Act of 1980 (Pub. L. 96-511), the reporting and recordkeeping provisions in 40 CFR 413.03 and 433.12 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.

XXII. List of subjects

40 CFR Part 413

Electroplating, Metals, Water pollution control, Waste treatment and disposal.

40 C[illegible] [illegible]t 433

Electroplating, Metals, Water pollution control, Waste treatment and disposal.

Dated: July 5, 1983.

William D. Ruckelshaus,

Administrator.

Authority: Secs. 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).

[**Note.**—These appendices will not appear in the CFR.]

XXIII. Appendices

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.

BMPS—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.

Captive—A facility which owns more than 50% (annual area basis) of the materials undergoing metal finishing.

Clean Water Act (also "the 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).

Development Document—*Development Document for Effluent Limitations, Guidelines, and Standards for the Metal Finishing Point Source Category*, EPA 440-1-80-091-A, June 1980.

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

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

Job Shop—A facility which owns not more than 50% (annual area basis) of the materials undergoing metal finishing.

Integrated facility—One that performs electroplating operations (including electroplating, electroless plating, chemical etching and milling, anodizing, coating, and printed circuit board manufacturing) as only one of several operations necessary for manufacture of a product at a single physical location, and has significant quantities of process wastewater from non-electroplating operations. In addition, to qualify as "integrated," a facility must combine one or more plant electroplating process wastewater lines before or at the point of treatment (or proposed treatment) with one or more plant sewers carrying process wastewater from non-electroplating manufacturing operations.

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

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

POTW—Publicly owned treatment works.

PSES—Pretreatment standards for existing sources of indirect discharges promulgated under Section 307(b) of the Act.

PSNS—Pretreatment standards for new sources of direct discharges, promulgated under Section 307 (b) and (c) of the Act.

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

TTO—Total Toxic Organics is the summation of all values greater than .01 milligrams per liter for each of the specified toxic organics.

Appendix B—Pollutants Excluded From Regulation

(1) Toxic Pollutants—found in only a small number of sources and effectively controlled by the technologies on which the limits are based:

Antimony
Arsenic
Asbestos
Beryllium
Mercury
Selenium
Thallium

(2) Conventional Pollutants:

BOD
Fecal Coliform

Appendix C—Unit Operations in the Metal Finishing Industry

1. @Electroplating
2. Electroless Plating
3. Anodizing
4. Coating (Chromating, Phosphating, and Coloring)
5. Chemical Etching and Milling
6. Printed Circuit Board Manufacturing
7. Cleaning
8. Machining
9. Grinding
10. Polishing
11. Tumbling
12. Burnishing
13. Impact Deformation
14. Pressure Deformation
15. Shearing
16. Heat Treating
17. Thermal Cutting
18. Welding
19. Brazing
20. Soldering
21. Flame Spraying
22. Sand Blasting
23. Other Abrasive Jet Machining
24. Electric Discharge Machining
25. Electrochemical Machining
26. Electron Beam Machining
27. Laser Beam Machining
28. Plasma Arc Machining
29. Ultrasonic Machining
30. Sintering
31. Laminating
32. Hot Dip Coating
33. Sputtering
34. Vapor Plating
35. Thermal Infusion
36. Salt Bath Descaling
37. Solvent Degreasing
38. Paint Stripping
39. Painting
40. Electrostatic Painting
41. Electropainting
42. Vacuum Metalizing
43. Assembly
44. Calibration
45. Testing
46. Mechanical Plating

PART 413—ELECTROPLATING POINT SOURCE CATEGORY

For the reasons stated above, EPA is amending Part 413 of 40 CFR, Chapter I as follows:

1. Section 413.01 is amended by revising paragraph (a) to read as follows:

§ 413.01 Applicability and compliance dates.

(a) This part shall apply to electroplating operations in which metal is electroplated on any basis material and to related metal finishing operations as set forth in the various subparts, whether such operations are conducted in conjunction with electroplating, independently, or as part of some other operation. The compliance deadline for metals and cyanide at integrated facilities shall be June 30, 1984. The compliance date for metals and cyanide at non-integrated facilities shall be April 27, 1984. Compliance with TTO for all facilities shall be July 15, 1986.[1] These

[1] 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 has moved 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.

Part 413 standards shall not apply to a facility which must comply with all the pollutant limitations listed in § 433.15 (metal finishing PSES).

* * * * *

2. Section 413.02 is amended by adding a new paragraph (i), as follows:

§ 413.02 General definitions.

* * * * *

(i) the term "TTO" shall mean total toxic organics, which is the summation of all quantifiable values greater than 0.01 milligrams per liter for the following toxic organics:
Acenaphthene
Acrolein
Acrylonitrile
Benzene
Benzidine
Carbon tetrachloride (tetrachloromethane)
Chlorobenzene
1,2,4-trichlorobenzene
Hexachlorobenzene
1,2-dichloroethane
1,1,1-trichloroethane
Hexachloroethane
1,1-dichloroethane
1,1,2-trichloroethane
1,1,2,2-tetrachloroethane
Chloroethane
Bis (2-chloroethyl) ether
2-chloroethyl vinyl ether (mixed)
2-chloronaphthalene
2,4,6-trichlorophenol
Parachlorometa cresol
Chloroform (trichloromethane)
2-chlorophenol
1,2-dichlorobenzene
1,3-dichlorobenzene
1,4-dichlorobenzene
3,3-dichlorobenzidine
1,1-dichloroethylene
1,2-trans-dichloroethylene
2,4-dichlorophenol
1,2-dichloropropane
(1,3-dichloropropene)
2,4-dimethylphenol
2,4-dinitrotoluene
2,6-dinitrotoluene
1,2-diphenylhydrazine
Ethylbenzene
Fluoranthene
4-chlorophenyl phenyl ether
4-bromophenyl phenyl ether
Bis (2-chloroisopropyl) ether
Bis (2-chloroethoxy) methane
Methylene chloride (dichloromethane)
Methyl chloride (chloromethane)
Methyl bromide (bromomethane)
Bromoform (tribromomethane)
Dichlorobromomethane
Chlorodibromomethane
Hexachlorobutadiene
Hexachlorocyclopentadiene
Isophorone
Naphthalene
Nitrobenzene
2-nitrophenol
4-nitrophenol
2,4-dinitrophenol
4,6-dinitro-o-cresol
N-nitrosodimethylamine
N-nitrosodiphenylamine
N-nitrosodi-n-propylamine
Pentachlorophenol
Phenol
Bis (2-ethylhexyl) phthalate
Butyl benzyl phthalate
Di-n-butyl phthalate
Di-n-octyl phthalate
Diethyl phthalate
Dimethyl phthalate
1,2-benzanthracene (benzo(a)anthracene)
Benzo(a)pyrene (3,4-benzopyrene)
3,4-Benzofluoranthene (benzo(b)fluoranthene)
11,12-benzofluoranthene (benzo(k)fluoranthene)
Chrysene
Acenaphthylene
Anthracene
1,12-benzoperylene (benzo(ghi)perylene)
Fluorene
Phenanthrene
1,2,5,6-dibenzanthracene (dibenzo(a,h)anthracene)
Indeno (1,2,3-cd) pyrene)
(2,3-o-phenylene pyrene)
Pyrene
Tetrachloroethylene
Toluene
Trichloroethylene
Vinyl chloride (chloroethylene)
Aldrin
Dieldrin
Chlordane (technical mixture and metabolites)
4,4-DDT
4,4-DDE (p,p-DDX)
4,4-DDD (p,p-TDE)
Alpha-endosulfan
Beta-endosulfan
Endosulfan sulfate
Endrin
Endrin aldehyde
Heptachlor
Heptachlor epoxide
(BHC-hexachlorocyclohexane)
Alpha-BHC
Beta-BHC
Gamma-BHC
Delta-BHC
(PCB-polychlorinated biphenyls)
PCB-1242 (Arochlor 1242)
PCB-1254 (Arochlor 1254)
PCB-1221 (Arochlor 1221)
PCB-1232 (Arochlor 1232)
PCB-1248 (Arochlor 1248)
PCB-1260 (Arochlor 1260)
PCB-1016 (Arochlor 1016)
Toxaphene
2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD)

3. Section 413.03 is amended by adding the following:

§ 413.03 Monitoring requirements.

(a) 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."

(b) 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.

(c) If monitoring is necessary to measure compliance with the TTO standard the industrial user need analyze only for those pollutants which would reasonably be expected to be present.

4. Section 413.14 is amended by adding paragraphs (f), (g), and (h), as follows:

§ 413.14 Pretreatment standards for existing sources.

* * * * *

(f) In addition to paragraphs (a) and (b) the following limitation shall apply for plants discharging less than 38,000 l (10,000 gal) per calendar day of electroplating process wastewater:

Pollutant or pollutant property	Maximum for any 1 day
TTO	4.57

(g) In addition to paragraphs (a), (c), (d), and (e) the following limitation shall apply for plants discharging 38,000 l (10,000 gal) or more per calendar day of electroplating process wastewater:

Pollutant or pollutant property	Maximum for any 1 day
TTO	2.13

(h) In addition to paragraphs (a), (b), (c), (d), (e), (f), and (g) the following shall apply: An existing source

submitting a certification in lieu of monitoring pursuant to § 413.03 of this regulation must implement the toxic organic management plan approved by the control authority.

5. Section 413.24 is amended by adding paragraph (f), (g) and (h), as follows:

§ 413.24 Pretreatment standards for existing sources.

* * * * *

(f) In addition to paragraphs (a) and (b) the following limitation shall apply for plants discharging less than 38,000 l (10,000 gal) per calendar day of electroplating process wastewater:

Pollutant or pollutant property	Maximum for any 1 day
TTO	4.57

(g) In addition to paragraphs (a), (c), (d), and (e) the following limitation shall apply for plants discharging 38,000 l (10,000 gal) or more per calendar day of electroplating process wastewater:

Pollutant or pollutant property	Maximum for any 1 day
TTO	2.13

(h) In addition to paragraphs (a), (b), (c), (d), (e), (f), and (g) the following shall apply: An existing source submitting a certification in lieu of monitoring pursuant to § 413.03 of this regulation must implement the toxic organic management plan approved by the control authority.

6. Section 413.44 is amended by adding paragraph (f), (g), and (h), as follows:

§ 413.44 Pretreatment standards for existing sources.

* * * * *

(f) In addition to paragraphs (a) and (b) the following limitation shall apply for plants discharging less than 38,000 l (10,000 gal) per calendar day of electroplating process wastewater:

Pollutant or pollutant property	Maximum for any 1 day
TTO	4.57

(g) In addition to paragraphs (a), (c), (d), and (e) the following limitation shall apply for plants discharging 38,000 l (10,000 gal) or more per calendar day of electroplating process wastewater:

Pollutant or pollutant property	Maximum for any 1 day
TTO	2.13

(h) In addition to paragraphs (a), (b), (c), (d), (e), (f), and (g) the following shall apply: An existing source submitting a certification in lieu of monitoring pursuant to § 413.03 of this regulation must implement the toxic organic management plan approved by the control authority.

7. Section 413.54 is amended by adding paragraph (f), (g), and (h), as follows:

§ 413.54 Pretreatment standards for existing sources.

* * * * *

(f) In addition to paragraphs (a) and (b) the following limitation shall apply for plants discharging less than 38,000 l (10,000 gal) per calendar day of electroplating process wastewater:

Pollutant or pollutant property	Maximum for any 1 day
TTO	4.57

(g) In addition to paragraphs (a), (c), (d), and (e) the following limitation shall apply for plants discharging 38,000 l (10,000 gal) or more per calendar day of electroplating process waterwater:

Pollutant or pollutant property	Maximum for any 1 day
TTO	2.13

(h) In addition to paragraphs (a), (b), (c), (d), (e), (f), and (g) the following shall apply: An existing source submitting a certification in lieu of monitoring pursuant to § 413.03 of this regulation must implement the toxic organic management plan approved by the control authority.

8. Section 413.64 is amended by adding paragraphs (f), (g), and (h), as follows:

§ 413.64 Pretreatment standards for existing sources.

* * * * *

(f) In addition to paragraphs (a) and (b) the following limitation shall apply for plants discharging less than 38,000 l (10,000 gal) per calendar day of electroplating process wastewater:

Pollutant or pollutant property	Maximum for any 1 day
TTO	4.57

(g) In addition to paragraphs (a), (c), (d), and (e) the following limitation shall apply for plants discharging 38,000 l (10,000 gal) or more per calendar day of electroplating process wastewater:

Pollutant or pollutant property	Maximum for any 1 day
TTO	2.13

(h) In addition to paragraphs (a), (b), (c), (d), (e), (f), and (g) the following shall apply: An existing source submitting a certification in lieu of monitoring pursuant to § 413.03 of this regulation must implement the toxic organic management plan approved by the control authority.

9. Section 413.74 is amended by adding paragraphs (f), (g) and (h), as follows:

§ 413.74 Pretreatment standards for existing sources.

* * * * *

(f) In addition to paragraphs (a) and (b) the following limitation shall apply for plants discharging less than 38,000 l (10,000 gal) per calendar day of electroplating process wastewater:

Pollutant or pollutant property	Maximum for any 1 day
TTO	4.57

(g) In addition to paragraphs (a), (c), (d), and (e) the following limitation shall apply for plants discharging 38,000 l (10,000 gal) or more per calendar day of electroplating process wastewater:

Pollutant or pollutant property	Maximum for any 1 day
TTO	2.13

(h) In addition to paragraphs (a), (b), (c), (d), (e), (f), and (g) the following shall apply: An existing source

submitting a certification in lieu of monitoring pursuant to § 413.03 of this regulation must implement the toxic organic management plan approved by the control authority.

10. Section 413.84 is amended by adding paragraphs (f), (g) and (h), as follows:

§ 413.84 Pretreatment standards for existing sources.

* * * * *

(f) In addition to paragraphs (a) and (b) the following limitation shall apply for plants discharging less than 38,000 l (10,000 gal) per calendar day of electroplating process wastewater:

Pollutant or pollutant property	Maximum for any 1 day
TTO	4.57

(g) In addition to paragraphs (a), (c), (d), and (e) the following limitation shall apply for plants discharging 38,000 l (10,000 gal) or more per calendar day of electroplating process wastewater:

Pollutant or pollutant property	Maximum for any 1 day
TTO	2.13

(h) In addition to paragraphs (a), (b), (c), (d), (e), (f), and (g) the following shall apply: An existing source submitting a certification in lieu of monitoring pursuant to § 413.03 of this regulation must implement the toxic organic management plan approved by the control authority.

In addition, for the reasons stated above, EPA is establishing a new Part 433 to Title 40 of the Code of Federal Regulations to read as follows:

PART 433—METAL FINISHING POINT SOURCE CATEGORY

Subpart A—Metal Finishing Subcategory

Sec.

433.10 Applicability; description of the metal finishing point source category.
433.11 Specialized definitions.
433.12 Monitoring requirements.
433.13 Effluent limitations representing the degree of effluent reduction attainable by applying the best practicable control technology currently available (BPT).
433.14 Effluent limitations representing the degree of effluent reduction attainable by applying the best available technology economically achievable (BAT).
433.15 Pretreatment standards for existing sources (PSES).
433.16 New source performance standards (NSPS).
433.17 Pretreatment standards for new sources (PSNS).
433.18 [Reserved]

Authority: Sec. 301, 304(b) (c), (e), and (g), 306(b) and (c), 307(b) and (c), 308 and 501 of the Clean Water Act (the Federal Water Pollution Control Act Amendments of 1971, as amended by the Clean Water Act of 1977) (the "Act"); 33 U.S.C. 1311, 1314(b) (c), (e), and (g), 1316(b) and (c), 1317(b) and (c), 1318 and 1361; 86 Stat. 816, Pub. L. 92-500; 91 Stat. 1567, Pub. L. 95-217.

Subpart A—Metal Finishing Subcategory

§ 433.10 Applicability; description of the metal finishing point source category.

(a) Except as noted in paragraphs (b) and (c), of this section, the provisions of this subpart apply to plants which perform any of the following six metal finishing operations on any basis material: Electroplating, Electroless Plating, Anodizing, Coating (chromating, phosphating, and coloring), Chemical Etching and Milling, and Printed Circuit Board Manufacture. If any of those six operations are present, then this part applies to discharges from those operations and also to discharges from any of the following 40 process operations: Cleaning, Machining, Grinding, Polishing, Tumbling, Burnishing, Impact Deformation, Pressure Deformation, Shearing, Heat Treating, Thermal Cutting, Welding, Brazing, Soldering, Flame Spraying, Sand Blasting, Other Abrasive Jet Machining, Electric Discharge Machining, Electrochemical Machining, Electron Beam Machining, Laser Beam Machining, Plasma Arc Machining, Ultrasonic Machining, Sintering, Laminating, Hot Dip Coating, Sputtering, Vapor Plating, Thermal Infusion, Salt Bath Descaling, Solvent Degreasing, Paint Stripping, Painting, Electrostatic Painting, Electropainting, Vacuum Metalizing, Assembly, Calibration, Testing, and Mechanical Plating.

(b) In some cases effluent limitations and standards for the following industrial categories may be effective and applicable to wastewater discharges from the metal finishing operations listed above. In such cases these Part 433 limits shall not apply and the following regulations shall apply:

Nonferrous metal smelting and refining (40 CFR Part 421)
Coil coating (40 CFR Part 465)
Porcelain enameling (40 CFR Part 466)
Battery manufacturing (40 CFR Part 461)
Iron and steel (40 CFR Part 420)
Metal casting foundries (40 CFR Part 464)
Aluminum forming (40 CFR Part 467)
Copper forming (40 CFR Part 468)
Plastic molding and forming (40 CFR Part 463)

(c) This Part does not apply to: (1) Metallic platemaking and gravure cylinder preparation conducted within printing and publishing facilities; and (2) existing indirect discharging job shops and independent printed circuit board manufacturers which are covered by 40 CFR Part 413.)

§ 433.11 Specialized definitions.

The definitions set forth in 40 CFR and the chemical analysis methods set forth in 40 CFR 136 are both incorporated here by reference. In addition, the following definitions apply to this part:

(a) The term "T", as in "Cyanide, T", shall mean total.

(b) The term "A", as in "Cyanide A", shall mean amenable to alkaline Chlorination.

(c) The term "job shop" shall mean a facility which owns not more than 50% (annual area basis) of the materials undergoing metal finishing.

(d) The term "independent" printed circuit board manufacturer shall mean a facility which manufacturers printed circuit boards principally for sale to other companies.

(e) The term "TTO" shall mean total toxic organics, which is the summation of all quantifiable values greater than .01 milligrams per liter for the following toxic organics:

Acenaphthene
Acrolein
Acrylonitrile
Benzene
Benzidine
Carbon tetrachloride (tetrachloromethane)
Chlorobenzene
1,2,4-trichlorobenzene
Hexachlorobenzene
1,2,-dichloroethane
1,1,1-trichloroethane
Hexachloroethane
1,1-dichloroethane
1,1,2-trichloroethane
1,1,2,2-tetrachloroethane
Chloroethane
Bis (2-chloroethyl) ether
2-chloroethyl vinyl ether (mixed)
2-chloronaphthalene
2,4,6-trichlorophenol
Parachlorometa cresol
Chloroform (trichloromethane)
2-chlorophenol
1,2-dichlorobenzene
1,3-dichlorobenzene
1,4-dichlorobenzene
N-nitrosodi-n-propylamine
Pentachlorophenol
Phenol
Bis (2-ethylhexyl) phthalate
Butyl benzyl phthalate
Di-n-butyl phthalate
Di-n-octyl phthalate
Diethyl phthalate
Dimethyl phthalate
1,2-benzanthracene (benzo(a)anthracene)

Benzo(a)pyrene (3,4-benzopyrene)
3,4-Benzofluoranthene (benzo(b)fluoranthene)
11,12-benzofluoranthene (benzo(k)fluoranthene)
Chrysene
Acenaphthylene
Anthracene
1,12-benzoperylene (benzo(ghi)perylene)
Fluorene
Phenanthrene
1,2,5,6-dibenzanthracene (dibenzo(a,h)anthracene
Indeno(1,2,3-cd) pyrene (2,3-o-phenlene pyrene)
Pyrene
Tetrachloroethylene
Toluene
Trichloroethylene
Vinyl chloride (chloroethylene)
3,3-dichlorobenzidine
1,1-dichloroethylene
1,2-trans-dichloroethylene
2,4-dichlorophenol
1,2-dichloropropane (1,3-dichloropropene)
2,4-dimethylphenol
2,4-dinitrotoluene
2,6-dinitrotoluene
1,2-diphenylhydrazine
Ethylbenzene
Fluoranthene
4-chlorophenyl phenyl ether
4-bromophenyl phenyl ether
Bis (2-chloroisopropyl) ether
Bis (2-chloroethoxy) methane
Methylene chloride (dichloromethane)
Methyl chloride (chloromethane)
Methyl bromide (bromomethane)
Bromoform (tribromomethane)
Dichlorobromomethane
Chlorsdibromomethane
Hexachlorobutadiene
Hexachlorocyclopentadiene
Isophorone
Naphthalene
Nitrobenzene
2-nitrophenol
4-nitrophenol
2,4-dinitrophenol
4,6-dinitro-o-cresol
N-nitrosodimethylamine
N-nitrosodimethylamine
Aldrin
Dieldrin
Chlordane (technical mixture and metabolites)
4,4-DDT
4,4-DDE (p,p-DDX)
4,4-DDD (p,p-TDE)
Alpha-endosulfan
Beta-endosulfan
Endosulfan sulfate
Endrin
Endrin aldehyde
Heptachlor
Heptachlor epoxide (BHC-hexachlorocyclohexane)
Alpha-BHC
Beta-BHC
Gamma-BHC
Delta-BHC
(PCB-polychlorinated biphenyls)
PCB-1242 (Arochlor 1242)
PCB-1254 (Arochlor 1254)
PCB-1221 (Arochlor 1221)
PCB-1232 (Arochlor 1232)
PCB-1248 (Arochlor 1248)
PCB-1260 (Arochlor 1260)
PCB-1016 (Arochlor 1016)
Toxaphene
2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD)

§ 433.12 Monitoring requirements.

(a) In lieu of requiring monitoring for TTO, the permitting authority (or, in the case of indirect dischargers, the control authority) may allow dischargers to make the following certification statement: "Based on my inquiry of the person or persons directly responsible for managing compliance with the permit limitation [or 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 of the last discharge monitoring report. I further certify that this facility is implementing the solvent management plan submitted to the permitting [or control] authority." For direct dischargers, this statement is to be included as a "comment" on the Discharge Monitoring Report required by 40 CFR 122.44(i), formerly 40 CFR 122.62(i). For indirect dischargers, the statement is to be included as a comment to the periodic reports required by 40 CFR 403.12(e). If monitoring is necessary to measure compliance with the TTO standard, the industrial discharger need analyse for only those pollutants which would reasonably be expected to be present.

(b) In requesting the certification alternative, a discharger shall submit a solvent management plan that specifies to the satisfaction of the permitting authority (or, in the case of indirect dischargers, the control authority) the toxic organic compounds used; the method of disposal used instead of dumping, such as reclamation, contract hauling, or incineration; and procedures for ensuring that toxic organics do not routinely spill or leak into the wastewater. For direct dischargers, the permitting authority shall incorporate the plan as a provision of the permit.

(c) Self-monitoring for cyanide must be conducted after cyanide treatment and befor dilution with other streams. Alternatively, samples may be taken of the final effluent, if the plant limitations are adjusted based on the dilution ratio of the cyanide waste stream flow to the effluent flow.

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

(a) 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 applying the best practicable control technology currently available (BPT):

BPT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Monthly average shall not exceed
	Milligrams per liter (mg/l)	
Cadmium (T)	0.69	0.26
Chromium (T)	2.77	1.71
Copper (T)	3.38	2.07
Lead (T)	0.69	0.43
Nickel (T)	3.98	2.38
Silver (T)	0.43	0.24
Zinc (T)	2.61	1.48
Cyanide (T)	1.20	0.65
TTO	2.13	
Oil & Grease	52	26
TSS	60	31
pH	(1)	(1)

[1] Within 6.0 to 9.0.

(b) Alternatively, for industrial facilities with cyanide treatment, and upon agreement between a source subject to those limits and the pollution control authority, the following amenable cyanide limit may apply in place of the total cyanide limit specified in paragraph (a) of this section:

Pollutant or pollutant property	Maximum for any 1 day	Monthly average shall not exceed
	Milligrams per liter (mg/l)	
Cyanide (A)	0.86	0.32

(c) No user subject to the provisions of this subpart shall augment the use of process wastewater or otherwise dilute the wastewater as a partial or total substitute for adequate treatment to achieve compliance with this limitation.

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

(a) 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 applying the best available technology economically achievable (BAT):

BAT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Monthly average shall not exceed
	Milligrams per liter (mg/l)	
Cadmium (T)	0.69	0.26
Chromium (T)	2.77	1.71
Copper (T)	3.38	2.07
Lead (T)	0.69	0.43

BAT EFFLUENT LIMITATIONS—Continued

Pollutant or pollutant property	Maximum for any 1 day	Monthly average shall not exceed
Nickel (T)	3.98	2.38
Silver (T)	0.43	0.24
Zinc (T)	2.61	1.48
Cyanide (T)	1.20	0.65
TTO	2.13	

(b) Alternatively, for industrial facilities with cyanide treatment, and upon agreement between a source subject to those limits and the pollution control authority, the following amenable cyanide limit may apply in place of the total cyanide limit specified in paragraph (a) of this section:

Pollutant or pollutant property	Maximum for any 1 day	Monthly average shall not exceed
	Milligrams per liter (mg/l)	
Cyanide (A)	0.86	0.32

(c) No user subject to the provisions of this subpart shall augment the use of process wastewater or otherwise dilute the wastewater as a partial or total substitute for adequate treatment to achieve compliance with this limitation.

§ 433.15 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 that introduces pollutants into a publicly owned treatment works must comply with 40 CFR Part 403 and achieve the following pretreatment standards for existing sources (PSES):

PSES FOR ALL PLANTS EXCEPT JOB SHOPS AND INDEPENDENT PRINTED CIRCUIT BOARD MANUFACTURERS

Pollutant or pollutant property	Maximum for any 1 day	Monthly average shall not exceed
	Milligrams per liter (mg/l)	
Cadmium (T)	0.69	0.26
Chromium (T)	2.77	1.71
Copper (T)	3.38	2.07
Lead (T)	0.69	0.43
Nickel (T)	3.98	2.38
Silver (T)	0.43	0.24
Zinc (T)	2.61	1.48
Cyanide (T)	1.20	0.65
TTO	2.13	

(b) Alternatively, for industrial facilities with cyanide treatment, upon agreement between a source subject to those limits and the pollution control authority. The following amenable cyanide limit may apply in place of the total cyanide limit specified in paragraph (a) of this section:

Pollutant or pollutant property	Maximum for any 1 day	Monthly average shall not exceed
	Milligrams per liter (mg/l)	
Cyanide (A)	0.86	0.32

(c) No user introducing wastewater pollutants into a publicly owned treatment works under the provisions of this subpart shall augment the use of process wastewater as a partial or total substitute for adequate treatment to achieve compliance with this standard.

(d) An existing source submitting a certification in lieu of monitoring pursuant to § 433.12 (a) and (b) of this regulation must implement the solvent management plan approved by the control authority.

(e) An existing source subject to this subpart shall comply with a daily maximum pretreatment standard for TTO of 4.57 mg/l.

(f) Compliance with the provisions of paragraph (c), (d), and (e) of this section shall be achieved as soon as possible, but not later than June 30, 1984, however metal finishing facilities which are also covered by Part 420 (iron and steel) need not comply before July 10, 1985.[1] Compliance with the provisions of paragraphs (a), (b), (c) and (d) of this section shall be achieved as soon as possible, but not later than Feburary 15, 1986.[1]

§ 433.16 New source performance standards (NSPS).

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

NSPS

Pollutant or pollutant property	Maximum for any 1 day	Monthly average shall not exceed
	Milligrams per liter (mg/l)	
Cadmium (T)	0.11	0.07
Chromium (T)	2.77	1.71
Copper (T)	3.38	2.07
Lead (T)	0.69	0.43
Nickel (T)	3.98	2.38
Silver (T)	0.43	0.24
Zinc (T)	2.61	1.48
Cyanide (T)	1.20	0.65
TTO	2.13	
Oil and Grease	52	26
TSS	60	31
pH	(1)	(1)

[1] Within 6.0 to 9.0.

[1] 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 has moved 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.

(b) Alternatively, for industrial facilities with cyanide treatment, and upon agreement between a source subject to those limits and the pollution control authority, the following amenable cyanide limit may apply in place of the total cyanide limit specified in paragraph (a) of this section:

Pollutant or pollutant property	Maximum for any 1 day	Monthly average shall not exceed
	Milligrams per liter (mg/l)	
Cyanide (A)	0.86	0.32

(c) No user subject to the provisions of this subpart shall augment the use of process wastewater or otherwise dilute the wastwater as a partial or total substitute for adequate treatment to achieve compliance with this limitation.

§ 433.17 Pretreatment standards for new sources (PSNS).

(a) Except as provided in 40 CFR 403.7, any new source subject to this subpart that introduces pollutants into a publicly owned treatment works must comply with 40 CFR Part 403 and achieve the following pretreatment standards for new sources (PSNS):

PSNS

Pollutant or pollutant property	Maximum for any 1 day	Monthly average shall not exceed
	Milligrams per liter (mg/l)	
Cadmium (T)	0.11	0.07
Chromium (T)	2.77	1.71
Copper (T)	3.38	2.07
Lead (T)	0.69	0.43
Nickel (T)	3.98	2.38
Silver (T)	0.43	0.24
Zinc (T)	2.61	1.48
Cyanide (T)	1.20	0.65
TTO	2.13	

(b) Alternatively, for industrial facilities with cyanide treatment, and upon agreement between a source subject to these limits and the pollution control authority, the following amenable cyanide limit may apply in place of the total cyanide limit specified in paragraph (a) of this section:

Pollutant or pollutant property	Maximum for any 1 day	Monthly average shall not exceed
	Milligrams per liter (mg/l)	
Cyanide (A)	0.86	0.32

(c) No user subject to the provisions of this subpart shall augment the use of process wastewater or otherwise dilute the wastewater as a partial or total substitute for adequate treatment to achieve compliance with this limitation.

(d) An existing source submitting a certification in lieu of monitoring pursuant to § 433.12 (a) and (b) of this regulation must implement the solvent management plan approved by the control authority.

§ 433.18 [Reserved]

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