ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 461

[WH-FRL 2516-2]

Battery Manufacturing Point Source Category; Effluent Limitations Guidelines, Pretreatment Standards, and New Source Performance Standards

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: This regulation establishes effluent limitations guidelines and standards limiting the discharge of pollutants into navigable waters and into publicly owned treatment works (POTW) by existing and new sources that conduct battery manufacturing operations. The Clean Water Act and a consent decree require EPA to issue this regulation.

This regulation establishes effluent limitations guidelines based on "best practicable technology" (BPT) and "best available technology" (BAT), new source performance standards (NSPS) based on "best demonstrated techology", and pretreatment standards for existing and new indirect dischargers (PSES and PSNS, respectively).

DATES: In accordance with 40 CFR 100.01 (45 FR 26048, April 17, 1980), this regulation shall be considered issued for purposes of judicial review at 1:00 p.m. Eastern time on March 23, 1984. This regulation shall become effective April 18, 1984.

The compliance date for the BAT regulations is as soon as possible, but in any event, 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 pretreatment standards for existing sources (PSES) is March 9, 1987.

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

ADDRESSES: The basis for this regulation is detailed in four major documents. See Supplementary Information (under "XIV. Availability of Technical Information") for a description of each document. Copies of the technical and economic documents may be obtained from the National Technical Information Service, Springfield, Virginia 22161 (703) 487-4600. For additional technical information contact Ms. Mary L. Belefski, Effluent Guidelines Division (WH-552), U.S. Environmental Protection Agency, 401 M Street, SW., Washington, D.C. 20460 (phone (202) 382-7126). Additional economic information may be obtained from Ms. Ellen Warhit, Economic Analysis Staff (WH-586), U.S. Environmental Protection Agency, 401 M Street, SW., Washington, D.C. 20460, phone (202) 382-5381.

The record for the final rule will be available for public review not later than May 9, 1984 in EPA's Public Information Reference Unit, 2904 (Rear) (EPA Library), 401 M Street, SW., Washington, D.C. The EPA public information regulation (40 CFR Part 2) provides that a reasonable fee may be charged for copying.

FOR FURTHER INFORMATION CONTACT: Ernst P. Hall (202) 382-7126.

SUPPLEMENTARY INFORMATION:

Organization of This Preamble

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 USC 1251 et seq., as amended by the Clean Water Act of 1977, Pub. L. 95-217), also called "the Act". It is also being promulgated in accordance with the Settlement Agreement in *Natural Resources Defense Council, Inc.* v. *Train*, 8 ERC 2120 (D.D.C. 1976), *modified*, 12 ERC 1833 (D.D.C. 1979), modified by Orders dated October 26, 1982, August 2, 1983, and January 6, 1984.

II. Scope of This Rulemaking

This regulation, which was proposed on November 10, 1982 (47 FR 51052), establishes effluent limitations guidelines and standards for existing and new battery manufacturing plants.

The battery manufacturing industry is included within the U.S. Department of Commerce Census Standard Industrial Classifications (SIC) 3691, Storage Batteries, and 3692, Primary Batteries, Dry and Wet.

Battery manufacturing began slowly after Galvani's invention of the galvanic cell in 1786 and developed into significance only after Leclanche in 1868 developed the forerunner of the modern dry cell. Rapid technological development and changing requirements over the last 50 or so years have caused and continue to cause new cell types to appear while some established cell types decline or become obsolete. With the established level of change within the industry and high level of research aimed at developing economic automotive power and load leveling batteries, there is a high probability of building new or enlarging existing plants and continuing change of battery production methods and battery types.

Battery manufacturing encompasses the production of modular electric power sources where part or all of the fuel is contained within the unit and electric power is generated directly from a chemical reaction rather than indirectly through a heat cycle engine. There are three major components of a cell—anode, cathode, and electrolyte—plus mechanical and conducting parts such as case, separator, or contacts. In the strictest sense, a cell contains only one anode-cathode pair whereas a battery is an assemblage of cells connected to combine their electrical output. Common usage has blurred the distinction between these terms. For the purpose of this regulation, the term battery includes both single cells and an assemblage of cells. Production includes electrode manufacture of anodes and cathodes, and associated ancillary operations necessary to produce a battery.

Water is used throughout battery manufacturing to clean battery components and to transport wastes. Water is used in the chemical systems to make most electrodes and special electrode chemicals; water is also a major component of most electrolytes and formation baths.

In this preamble, the following terminology is used. A battery manufacturing site is one physical location (i.e., a particular street address) where battery manufacturing processes occur. A battery plant is the location where subcategory-specific battery manufacturing process elements occur. Two or more battery plants may be located at a particular site. Finally a battery facility is a location where final battery type products or their components are produced. One battery plant can produce more than one battery type product. For example, at one site with the address of 100 Main Street, there are two battery plants that perform manufacturing processes: one plant in the lead subcategory and the other plant in the zinc subcategory. One plant includes a facility producing lead-acid batteries, and the other plant includes two facilities: one producing alkaline manganese batteries and the other producing silver-zinc batteries.

EPA estimates that there are about 230 battery manufacturing sites in the United States. A substantial majority of these are located in California, Pennsylvania, North Carolina, and Texas. The remaining sites are scattered geographically throughout the United States.

III. Summary of Legal Background

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

The Act included a timetable for issuing these standards. However, EPA was unable to meet many of the deadlines and, as a result, in 1976, it was sued by several environmental groups. In settling this lawsuit, EPA and the plaintiffs executed a "Settlement Agreement" which was approved by the court. This Agreement required EPA to develop a program and adhere to a schedule in promulgating effluent limitations guidelines, new source performance standards, and pretreatment standards for 65 "priority" pollutants and classes of pollutants for 21 major industries. See *Natural Resources Defense Council, Inc.* v. *Train*, 8 ERC 2120 (D.D.C. 1976), *modified*, 12 ERC 1833 (D.D.C. 1979), modified by Orders dated October 26, 1982, August 2, 1983 and January 6, 1984.

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

Under the Act, the EPA is to set a number of different kinds of effluent limitations. These are discussed in detail within this preamble to the regulation and in the record to this rulemaking. They are summarized briefly below:

1. Best Practicable Control Technology (BPT)

BPT limitations are generally based on the average of the best existing performance by plants of various sizes, ages, and unit processes within the category or subcategory.

In establishing BPT limitations, EPA considers the total cost in relation to the age of equipment and facilities involved, the processes employed, process changes required, engineering aspects of the control technologies, and nonwater quality environmental impacts (including energy requirements). The Agency balances the total cost of applying the technology against the effluent reduction.

2. Best Available Technology (BAT)

BAT limitations, in general, represent the best existing performance in the industrial subcategory or category. The Act establishes BAT as the principal national means of controlling the direct discharge of toxic and nonconventional pollutants to navigable waters.

In arriving at BAT, the Agency considers the age of the equipment and facilities involved, the process employed, the engineering aspects of the control technologies, process changes, the cost of achieving such effluent reduction, and nonwater quality environmental impacts. The Agency retains considerable discretion in assigning the weight to be accorded these factors.

3. Best Conventional Pollutant Control Technology (BCT)

The 1977 Amendments to the Clean Water Act added Section 301(b)(2)(E), establishing "best conventional pollutant control technology" (BCT) for discharge of conventional pollutants from existing industrial point sources. Section 304(a)(4) designated the following as conventional pollutants: BOD, TSS, fecal coliform, pH, and any additional pollutants defined by the Administrator as conventional. 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 that 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.)

A revised methodology for the general development of BCT limitations was proposed on October 29, 1982 (47 FR 49176). BCT limits for this category are accordingly deferred until promulgation of the final methodology for BCT development.

4. New Source Performance Standards (NSPS)

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

5. Pretreatment Standards for Existing Sources (PSES)

PSES are designed to prevent the discharge of pollutants that pass through, interfere with, or are otherwise incompatible with the operation of publicly owned treatment works (POTW). They must be achieved within three years of promulgation. The Clean Water Act of 1977 requires pretreatment for toxic pollutants that pass through the POTW in amounts that would violate direct discharger effluent limitations or interfere with the POTW's treatment process or chosen sludge disposal method. The legislative history of the 1977 Act indicates that pretreatment standards are to be technology-based, analogous to the best available technology for removal of toxic pollutants. EPA has generally determined that pollutants pass through a POTW if the nationwide average percentage of pollutants removed by a well-operated POTW achieving secondary treatment is less than the percent removed by the BAT model treatment system. The General Pretreatment Regulations, which serve as the framework for the pretreatment regulations, are found at 40 CFR Part 403.

6. Pretreatment Standards for New Sources (PSNS)

Like PSES, PSNS are designed to prevent the discharge of pollutants which pass through, interfere with, or are otherwise incompatible with the operation of a POTW. PSNS are to be issued at the same time as NSPS. New indirect dischargers, like new direct dischargers, have the opportunity to incorporate in their plant the best available demonstrated technologies. The Agency considers the same factors in promulgating PSNS as it considers in promulgating PSES.

IV. Methodology and Data Gathering Efforts

The methodology and data gathering efforts used in developing the proposed regulation were summarized in the "Preamble to the Proposed Battery Manufacturing Point Source Category Effluent Limitations Guidelines, Pretreatment Standards, and New Source Performance Standards" (47 FR 51052, November 10, 1982), and described in detail in the *Development Document for Effluent Limitations Guidelines and Standards for the Battery Manufacturing Point Source Category* which is referred to in this preamble as development document.

Following proposal of the regulation the Agency provided a sixty-day period for comments, which was scheduled to close on January 10, 1983. At the request of many commenters the comment period was extended for all subcategories until January 24, 1983 and for the lead subcategory until February 7, 1983. The Agency received over 300 individual comments from 24 different commenters.

After considering the comments, the Agency decided to collect additional information relating primarily to the lead subcategory. The Battery Council International (BCI), in coordination with the Agency, developed an industry survey which the Council distributed to their membership and to the Independent Battery Manufacturers Association (IBMA). Completed forms were sent to the EPA at the request of BCI. These surveys contained information on process element flows, treatment system operating characteristics, solid waste disposal, and personal hygiene and cleaning practices required at the plant.

The Agency also made engineering visits to seventeen lead battery manufacturing sites and one foliar battery (Leclanche subcategory) manufacturing site to determine pollutant and flow characteristics of process and nonprocess wastewater streams at these battery plants. During plant visits the Agency collected information, where available, about the quality and flow of raw and treated wastewater. We also received treatment effectiveness data from the plants where monitoring was conducted. Additionally, we collected samples for chemical analysis at five of these sites to determine the nature of the wastewater streams and the effectiveness of end-of-pipe treatment.

As an indication of the effectiveness of existing treatment systems, we also collected discharge monitoring report (DMR) data from state and EPA Regional offices for direct dischargers in the lead subcategory and other battery subcategories. DMR data are self monitoring data supplied by permit holders to meet state or EPA permit requirements. State and EPA Regional offices provided data for five of the eight lead subcategory direct dischargers. Two of these sites had well-operated lime and settle treatment systems.

The Agency performed additional analysis of the new and existing data. All additional data and activities are described in the "Notice of Data Availability and Request for Comment" (48 FR 52604, November 21, 1983) and are also described in substantial detail in the appropriate sections of the development document. The supporting information and additional data are in the public record supporting this final rule.

V. Control Treatment Options and Technology Basis for Final Regulation

A. Summary of Category

The battery manufacturing industry is generally included within SIC 3691 and 3692 of the Standard Industrial Classification Manual, prepared in 1972 and supplemented in 1977 by the Office of Management and Budget, Executive Office of the President.

There are approximately 255 battery manufacturing plants distributed throughout the United States, with the majority located east of the Mississippi River. The data base includes 22 direct dischargers, 150 indirect dischargers, and 83 plants that do not discharge wastewater. Nineteen plants have closed since the proposed rules appeared in November, 1982. The battery manufacturing category employs an estimated 31,000 people with a total production estimated at 1,400,000 kkg of batteries (1,540,000 tons) per year.

The most important pollutants or pollutant parameters generated in battery manufacturing wastewaters are (1) toxic metals—arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, and zinc; (2) nonconventional pollutants—aluminum, cobalt, iron, manganese, and COD; and (3) conventional pollutants—oil and grease, TSS, and pH. Toxic organic pollutants generally were not found in large quantities although some cyanide was found in a few subcategories. Because of the amount of toxic metals present, the sludges generated during wastewater treatment generally contain substantial amounts of toxic metals.

In developing this regulation, it was necessary to determine whether different effluent limitations guidelines and standards were appropriate for different segments (subcategories) of the industry. The major factors considered in assessing the need for subcategorization and in identifying subcategories included: waste characteristics, raw materials, manufacturing processes, products manufactured, water use, water pollution control technology, treatment costs, solid waste generation, size of plant, age of plant, number of employees, total energy requirements, nonwater quality characteristics, and unique plant characteristics. Section IV of the development document contains a detailed discussion of these factors and the rationale for subcategorization. The subcategorization scheme has remained unchanged from proposal.

The subcategories within battery manufacturing are primarily based on anode material. Eight subcategories are addressed in this regulation: cadmium, calcium, lead, Leclanche (zinc anode with an acid eletrolyte), lithium, magnesium, zinc (with alkaline electrolyte), and nuclear. Manufacturing operations differ widely, both within and among subcategories. Subcategory manufacturing process elements are selected so that manufacturing operations within a subcategory are similar and are amenable to a common regulation.

Several unit processes that are associated with other industrial categories are frequently found at battery manufacturing plants and are being regulated in this battery manufacturing regulation. Grid casting, continuous (direct chill) casting of lead, and melting furnaces as they apply to battery manufacturing are regulated here rather than in the metal molding and casting regulation. The wastestreams associated with these unit processes are mold release preparation, direct chill casting, contact cooling water and wet air pollution control associated with these processes.

Lead rolling performed at lead battery manufacturing plants is addressed here rather than in the nonferrous metals forming regulation. EPA is aware of five battery manufacturing plants that have lead rolling operations; however, there is no discharge of wastewater from the lead rolling processes at these plants. Currently these plants contract haul the small amounts of wastewater generated. Accordingly, there are no limitations and standards for this unit process proposed or promulgated. If a plant discharges from this unit process, a discharge allowance may be established on a case-by-case basis using guidance contained in the development document.

B. Control and Treatment Options

Prior to proposing the battery manufacturing regulation, EPA considered a wide range of control and treatment options including both in-process changes and end-of-pipe treatment. These options are discussed in detail in the preamble to the proposed regulation (47 FR 51052). The control and treatment technologies used as the basis for the final limitations and standards are described below.

Current wastewater treatment systems in the battery manufacturing category range from no treatment to a sophisticated physical-chemical treatment (although generally not operated properly) combined with water conservation practices. Of the 255 plants in the data base, 26 percent of the plants have no treatment and do not discharge, 7 percent of the plants have treatment and do not discharge, 15 percent discharge without any treatment, 17 percent have only pH adjustment systems, 4 percent have only sedimentation or clarification devices, 23 percent have equipment for chemical precipitation and settling, 6 percent have equipment for chemical precipitation, settling and filtration, and 2 percent have other treatment systems. The zero discharge plants employ a combination of process operations which do not generate process wastewater, provide in-process or end-of-pipe treatment which eliminates wastewater discharge, or dispose of the wastewater on land. Even though treatment systems are in-place at many plants, the category is generally inadequate in wastewater treatment practices. The systems in-place are generally inadequately sized, poorly maintained, or improperly operated (systems overloaded, solids not removed, pH not controlled, etc.). EPA has determined, therefore, that wastewater treatment practices in the battery manufacturing category are uniformly inadequate and, as discussed below, EPA is transferring performance data from other industrial categories with similar wastewaters.

For the category as a whole, in general, there is no significant difference between direct or indirect dischargers in the nature or degree of treatment employed. Section V of the development document evaluates the treatment systems in-place and the effluent data received.

The control and treatment technologies available for this category include both in-process and end-of-pipe treatments. These technologies are described in Section VII of the development document. In-process treatment includes a variety of water-flow-reduction steps and major process changes such as: cascade and countercurrent rinsing (to reduce the amount of water used to remove unwanted materials from electrodes); consumption of cleansed wastewater in product mixes; and substitution of nonwastewater-generating forming (charging) systems. End-of-pipe treatment includes: Hexavalent chromium reduction; chemical precipitation of metals using hydroxides, carbonates, or sulfides; and removal of precipitated metals and other materials using settling or sedimentation; filtration; and combinations of these technologies.

The treatment effectiveness of the above technologies has been evaluated by observing the performance of these technologies on battery manufacturing and other similar wastewaters. The data base for the performance of lime-and-settle technology is a composite of data drawn from EPA protocol sampling and analysis of aluminum forming, copper forming, battery manufacturing, porcelain enameling, and coil coating wastewaters. These data, called the combined metals data base (CMDB), consist of influent and effluent concentrations for nine pollutants. The wastewaters are judged to be similar in all material respects for treatment because they contain similar ranges of dissolved metals which can be removed by precipitation and solids removal to comparable concentrations.

We regard the combined metals data base as the best available measure for establishing the concentrations of the nine pollutants attainable with lime and settle. Our determination is based on the similarity of the raw and treated wastewaters among the different categories as supported by a statistical analysis for homogeneity. (A separate study of statistical homogeneity of the wastewaters of categories in the CMDB is part of the record of this rulemaking.) The CMDB provides a larger quantity of data that are similar from both technical and statistical standpoints than would be available from any one category alone. The larger quantity of data in the combined metals data enhances the Agency's ability to estimate long-term performance and variability through statistical analysis.

The Agency received comments that there were not enough data points from battery manufacturing used in the combined metals data base (CMDB) to calculate the lead treatment effectiveness concentrations for the lead subcategory. Commenters recommended that EPA collect additional lead data from specified plants. In response to these comments, the Agency visited various suggested plants, as discussed in detail in Section IX of this preamble. As a result, we received long term self monitoring (raw and treated) wastewater data from one lead plant which has lime and settle technology, other raw and treated wastewater sampling data collected by EPA since proposal, and plant-supplied effluent data from various treatment technology systems. The daily and monthly treatment effectiveness concentrations for the pollutant lead were re-examined in light of the additional data. As discussed in the response to comments on the lead treatment effectiveness concentrations in Section IX, of this preamble, the additional data were screened, leaving one additional plant with over 200 observations. Data from this plant and the one lead battery plant in the CMDB at proposal were used to recalculate daily and monthly treatment effectiveness concentrations. In addition, DMR data from these plants were evaluated and show compliance with the concentration basis for this regulation. The details of calculating the lead treatment effectiveness concentrations and DMR data analysis are described in "Calculation of Lead Treatment Effectiveness Concentrations for the Battery Manufacturing Point Source Category" which is in the administrative record of this rulemaking.

The Agency also examined the performance of filter technology based on the performance of full-scale commercial systems. Twenty-nine battery manufacturing plants reported that they are using a filter. Even though filters are in-place in this category, their operation is generally inadequate in the category (e.g. filters were used as primary solids removal devices). The Agency then examined untreated wastewaters from porcelain enameling (a category for which filtration data were available) and battery manufacturing and determined that they are similar in all material respects based on an analysis for homogeneity of the raw waste values. Therefore, the performance of lime, settle, and filter (LS&F) systems used in porcelain enameling can be and has been applied to assessing the effectiveness of filters in treating battery manufacturing wastewaters. Lime, settle and filter data were also obtained from a primary zinc smelter in the nonferrous metals manufacturing category. The raw wastewater characteristics of the smelter wastewater were within the range of raw wastewater characteristics in the CMDB data and the smelter wastewater was therefore considered to be similar to the CMDB wastewater which includes wastewater from battery manufacturing. The treatment effectiveness concentrations used for lime, settle and filter treatment were based on a summary of the long term data from two porcelain enameling plants and one nonferrous metals manufacturing plant.

After proposal, the Agency collected and analyzed samples from two battery manufacturing plants with end-of-pipe filtration. One plant uses end-of-pipe filtration as its primary means of solids removal after caustic addition. The other plant uses filtration in a polishing filter configuration following lime and settle treatment. The first system would be expected to operate at about the equivalent of lime and settle. The second system by design would represent lime, settle and filter; however, this plant was visited by EPA personnel and was observed to be operated improperly. (The clarifier overflow was being acidified before introduction into the filter.) Despite the observed shortcoming, the samples collected and analyzed at these two plants showed that they were able to achieve the lime, settle and filter treatment effectiveness concentrations used at proposal for the pollutant lead.

The Agency did not modify the proposed lime, settle and filter treatment effectiveness concentrations by using the battery manufacturing data because of the shortcomings described above. However, the samples collected and analyzed by EPA support the treatment effectiveness concentrations using the proposed lime, settle and filter data. In fact, use of these data alone would result in LS&F treatment effectiveness concentrations lower than those used at proposal.

The combined metals data are discussed in more detail in Section IX in this preamble, in Section VII of the development document and in the document "A Statistical Analysis of the Combined Metals Industries Effluent Data" and "Revisions to Data and Analysis of the Combined Metals Data Base" which are in the administrative record for this rulemaking.

Flow reduction is a significant part of the overall pollutant reduction technology for this category. The Agency is promulgating mass-based limitations and standards which account for the significant pollutant removal achieved by flow reduction model technology. Mass-based limits ensure reduction of the total quantity of pollutant discharge. The mass-based limitations and standards established for this category are derived by multiplying the regulatory flow (l/kg) by the overall treatment effectiveness (mg/l) for the model end-of-pipe treatment. The regulatory flows are based on flow data, normalized to production, which were supplied by the industry, and engineering analysis of the data. The production normalized flows used to determine the regulatory flow for each process element are presented in Section V of the development document. Determination of the regulatory flows is presented in Section IX, X, XI, and XII of the development document. Responses to comments relative to the selection of regulatory flows are provided in the Response to Comments Document in the record of this rulemaking.

The monitoring provisions of the final rule are the same as those contained in the proposed rule.

C. Technology Basis for Final Regulation

A brief summary of the technology basis for the regulation is presented below. A more detailed discussion is presented in the development document.

The Agency is promulgating BPT and BAT limitations for the cadmium, lead, and zinc subcategories. The remaining five subcategories are excluded from BPT and BAT limitations for the reasons discussed in Section VIII of the preamble.

BPT: In developing the BPT limitations, the Agency considered the amount of water used per unit of production in each subcategory process element by each plant which was sampled or which supplied usable data in the Agency's initial data collection effort. These data were used to determine the average water use for each subcategory process element. The end-of-pipe treatment technology that seemed appropriate for BPT level treatment of these flows and was practiced in some plants throughout the category was selected. This treatment generally consists of: Hexavalent chromium reduction when required; oil skimming; hydroxide (or lime) precipitation, if not accomplished by pH adjustment; and sedimentation to remove the resultant precipitate and other suspended solids. Sludge from the settling tank is concentrated to facilitate metals recovery or landfill disposal. The effluent that would be expected to result from the application of these technologies was derived by evaluating the performance of some of the best plants in this category and in other categories treating similar wastewaters with these technologies. Section VII and IX of the development document explain the derivation of treatment effectiveness data and the calculation of BPT limitations.

To comply with BPT limitations, EPA estimates (1983 $) that total capital investment would be $0.877 million and that annual cost would be $0.559 million, including interest and depreciation. (These costs assume plants will install BPT treatment systems at the BPT regulatory flow or the actual plant flow if it is lower than the BPT regulatory flow. Similarly, BAT and pretreatment costs assume that the plant flow is reduced to the flow basis for that limitation or standard.) EPA expects no plant closures, unemployment, or changes in industry production capacity as a result of the BPT effluent limitations. These BPT limitations will result in the removal of 72,133 kg/yr (158,693 lb/yr) of toxic pollutants and 115,537 kg/yr (254,181 lb/yr) of other pollutants from the estimated current discharges. The Agency has determined that the effluent reduction benefits associated with compliance with BPT limitations justify these costs.

Cadmium Subcategory BPT. EPA is promulgating BPT effluent limitations based on oil skimming and lime and settle technology. Implementation of BPT limitations will remove 69,598 kilograms (153,437) pounds per year of toxic metals and 101,255 kilograms (223,230 pounds) per year of conventional and other pollutants from the estimated current discharge, at a capital cost, above equipment in place, of $0.088 million and a total annual cost of $0.034 million. The Agency has determined that the effluent reduction benefits associated with compliance with BPT justify the costs.

Lead Subcategory BPT. EPA is promulgating BPT effluent limitations based on oil skimming and lime and settle technology. Implementation of BPT limitations will remove 1,442 kilograms (3,172 pounds) per year of toxic metals and 13,493 kilograms (29,685 pounds) per year of conventional and other pollutants from the estimated current discharge, at a capital cost, above equipment in place, of $0.715 million and a total annual cost of $0.499 million. The Agency has determined that the effluent reduction benefits associated with compliance with BPT justify the costs.

Several of the regulatory flows used as the basis for BPT (referred to as regulatory flows or BPT flows) changed from those proposed to reflect updated information on plant flows and production and to reflect to more accurate assessment of flow reduction practices within the subcategory. These flows are discussed briefly in Section IX of this preamble and in Section IX of the development document. The limitations presented in the final BPT regulation reflect these changes.

Zinc Subcategory BPT. EPA is promulgating BPT effluent limitations based on oil skimming and lime and settle technology. Implementation of BPT limitations will remove 1,093 kilograms (2,410 pounds) per year of toxic metals and 789 kilograms (1,740 pounds) per year of conventional and other pollutants from the estimated current discharge, at a capital cost, above equipment in place, of $0.073 million and a total annual cost of $0.027 million. The Agency has determined that the effluent reduction benefits associated with compliance with BPT justify the costs.

BAT: EPA is promulgating BAT mass limitations based on the BPT model end-of-pipe common treatment plus flow reduction. The Agency is promulgating BAT limitations based on the same end-of-pipe treatment technology as that of the proposed limitations. The BAT limitations are promulgated as proposed without change except for corrections in the treatment effectiveness concentrations in the CMDB for all subcategories, and also for flows in the lead subcategory.

In developing BAT limitations, the Agency considered the amount of water used per unit of production (liters per metric ton or gallons per ton) for each wastewater stream.

Implementation of the BAT limitations will remove annually an estimated 72,844 kg (160,257 pounds) per year of toxic metal and 119,100 kg (262,020 pounds) of other pollutants (from estimated current discharge) at a capital cost, above equipment in place, of $1.1 million and a total annual cost of $0.60 million. BAT will remove 711 kilograms (1,564 pounds) per year of toxic pollutants incrementally above BPT.

At the time of proposal, EPA indicated that it was seriously considering basing the final regulation on more stringent technologies than those used as the basis for the proposal. Technology additions discussed included filtration, ion exchange and reverse osmosis. As discussed later in this preamble, EPA continues to believe that these technologies are available and can be used to effectively treat battery manufacturing wastewaters.

However, EPA has concluded that compliance with the promulgated limitations will remove practically all the toxic and other pollutants from battery manufacturing wastewater discharges. The BAT limitations will remove approximately 99.78 percent of current toxic pollutant discharges. Given the results achieved by the technologies used as a basis for the promulgated limitations, further treatment would result only in deminimis, insignificant reductions in annual national discharges. Accordingly, EPA has determined that the total amount of each pollutant in the remaining discharges after compliance with BAT does not justify establishing a national requirement based on additional end-of-pipe technology.

Although EPA is not basing the final regulations directly on these additional technologies, their availability, effectiveness and affordability provides significant support for EPA's conclusion that the effluent limitations promulgated today are both technologically and economically achievable. In particular, an alternative means to achieve the promulgated limitations would be to use a less rigorous lime and settle treatment system with flow reduction and add a filter to the end-of-pipe technology. As shown in Section VII of the development document, filters generally reduce discharges of toxic metal pollutants by an average of 33 percent. Moreover, EPA has collected data from two lead battery plants using precipitation and filtration that achieve the concentrations used as a basis for the promulgated regulation. EPA's economic analysis has shown that the addition of filtration at existing plants does not result in any closures or other significant adverse economic impacts. Therefore, many plants can afford to add filtration to the recommended technology and thereby provide further assurance that the applicable limitations are met.

Cadmium Subcategory BAT. EPA is promulgating BAT effluent limitations based on flow reduction, oil skimming, and lime and settle technology. Implementation of BAT limitations will remove 70,096 kilograms (154,535 pounds) per year of toxic metals and 109,614 kilograms (241,656 pounds) per year of other pollutants from the estimated current discharges at a capital cost, above equipment in place, of $0.179 million and a total annual cost of $0.055 million. The Agency projects no plant closures, employment impacts or foreign trade effects and has determined that the BAT limitations are economically achievable.

Lead Subcategory BAT. EPA is promulgating BAT effluent limitations based on flow reduction, oil skimming and lime and settle technology. Implementation of BAT limitations will remove 1,634 kilograms (3,595 pounds) per year of toxic metals and 16,787 kilograms (36,931 pounds) per year of other pollutants from the estimated current discharges at a capital cost, above equipment in place, of $0.819 million and a total annual cost of $0.510 million. The Agency projects no plant closures, employment impacts or foreign trade effects and has determined that the BAT limitations are economically achievable.

Several of the regulatory flows used as the basis for BAT (referred to as regulatory flows or BAT flows) changed from the proposed regulation to reflect updated information on plant flows and production and to reflect a more accurate assessment of flow reduction practices within the subcategory. These flows are discussed in Section IX of this preamble and in Section X of the development document. The limitations presented in the final BAT regulation reflect these changes.

Zinc Subcategory BAT. EPA is promulgating BAT effluent limitations based on flow reduction, oil skimming, and lime and settle technology. Implementation of BAT limitations will remove 1,114 kilograms (2,456 pounds) per year of toxic metals and 1,058 kilograms (2,332 pounds) per year of other pollutants from the estimated current discharges at a capital cost, above equipment in place, of $0.131 million and a total annual cost of $0.035 million. The Agency projects no plant closures, employment impacts or foreign trade effects and has determined that the BAT limitations are economically achievable.

EPA considered basing BAT for the zinc subcategory on the use of sulfide precipitation rather than lime precipitation, due to its superiority in removing mercury. The Agency rejected this option, however because of the considerable difficulty and expense of retrofitting existing plants with adequate ventilation and other safety measures that are needed to ensure that this technology is used safely.

NSPS: EPA is promulgating NSPS as proposed for the calcium, lithium and magnesium subcategories, and slightly less stringent NSPS than those contained in the proposal for the cadmium, lead, zinc and Leclanche subcategories. In developing NSPS, the Agency considered the amount of water used and discharged per unit of production based on the best demonstrated process changes and the best demonstrated end-of-pipe technology to reduce pollutant discharges to the maximum extent feasible. However, the NSPS being promulgated are not based on the use of major incremental end-of-pipe treatment technologies beyond precipitation, sedimentation and filtration to address de minimis discharges that remain after such treatment. As discussed in Section VI of this preamble, the promulgated NSPS do not pose a barrier to entry for new plants in the category.

For the cadmium, lead, and zinc subcategories, EPA proposed NSPS based on precipitation, sedimentation and filtration plus additional technologies including reverse osmosis for the lead and zinc subcategories, and ion exchange and distillation for the cadmium subcategory. Comments on the effectiveness, level of demonstration and environmental need for these technologies were few and mixed.

EPA believes that all of the technologies used as a basis for the proposed NSPS are available, demonstrated technologies. (See Section IX of this preamble for a more detailed discussion of the reverse osmosis technology.) However, EPA has decided to base NSPS on end-of-pipe treatment which generally only adds polishing filtration to the recommended end-of-pipe BAT technologies. The promulgated NSPS limitations will result in the discharge of only a miniscule amount of pollutants from new plants. EPA has concluded that a national standard based on the use of advanced end-of-pipe treatment technology beyond the recommended BAT plus filtration end-of-pipe treatment in order to remove the very small amount of pollutants remaining is not warranted.

The selected NSPS option of filtration is an available, demonstrated technology. As noted previously, however, the use of this technology in the battery category is generally inadequate. Therefore, filter data from the porcelain enameling and nonferrous metals categories have been transferred to the battery category.

One additional modification of the proposal relates to the type of precipitation recommended to be used as part of the precipitation and sedimentation system. The proposed NSPS for the lead and zinc subcategories were based upon the use of sulfide precipitation in conjunction with end-of-pipe filtration. The final promulgated NSPS are based upon sulfide precipitation for the zinc subcategory and lime precipitation for the cadmium and lead subcategories. In general the incremental removal achieved by the use of sulfide technology in addition to lime precipitation technology is extremely small. However, sulfide precipitation is superior to lime precipitation in removing mercury, an exceptionally toxic metal that is of special concern in zinc subcategory discharges. Sulfide precipitation can be performed safely by building appropriate ventilation into new zinc subcategory plants and by following safe operating practices. Sulfide precipitation is demonstrated in this subcategory.

For the Leclanche subcategory, the Agency proposed zero discharge for NSPS. EPA recieved comments on the manufacture of foliar batteries and concluded that because of product quality considerations a discharge allowance for foliar batteries is warranted (see Section IX of this preamble). End-of-pipe treatment is the same as for PSES, which is lime, settle and filter technology.

For all subcategories other than lead, the costs for new sources associated with compliance of this regulation would be extremely variable. New sources can select manufacturing processes which do not generate wastewater, as is practiced at present by at least one plant in each subcategory. Plants using the no discharge processes would incur no compliance costs associated with this regulation. Alternatively new sources can choose various combinations of dry and wet manufacturing processes. For these reasons there is no rational methodology which can be used to project model plants for these subcategories. Therefore, existing plant cost estimates were used to evaluate the new source options for the cadmium, calcium, Leclanche, lithium, magnesium and zinc subcategories. The new source technology would reduce the toxic pollutant levels to 2.3 kilograms (5 pounds) per year per plant, and the discharge of other pollutants to 34.7 kilograms (76.6 pounds) per year per plant. The capital investment cost for an average plant to install the new source option would be $41,228 and the annual cost for an average plant would be $16,344. Details of the costs for end-of-pipe treatment systems and in-process technologies are presented in Section VIII of the development document.

EPA estimates that a new direct discharge lead battery manufacturing plant having the subcategory average annual production level would generate a raw waste of 14,458 kilograms (31,808 pounds) per year of toxic pollutants and 84,919 kilograms (186,822 pounds) per year of other pollutants. The NSPS technology would reduce the toxic pollutant levels to 4.34 kilograms (9.55 pounds) per year and the discharge of other pollutants to 42 kilograms (92.4 pounds) per year. The capital investment cost for a new model lead battery manufacturing plant to install the NSPS technology is estimated to be $0.119 million, with annual costs of $0.069 million.

PSES: EPA is promulgating PSES as proposed except in the lead and Leclanche subcategories. PSES is equivalent to BAT for the cadmium, lead, and zinc subcategories, which consists of end-of-pipe treatment comprised of flow reduction, oil skimming and lime and settle technology.

The Agency proposed to regulate pollutants (primarily toxic metals) at PSES that would pass through a POTW.

The average percentage of the toxic metal pollutants removed by a POTW nationwide ranges from 19 to 66 percent, whereas the percentage that can be removed by a battery manufacturing direct discharger applying the best available technology is expected to be over 99 percent. These pollutants would pass through a POTW and as such are regulated by PSES. The same pollutants that were regulated by the proposed regulation are regulated by the promulgated PSES.

An additional reason for regulating a variety of toxic metals at PSES is that toxic metals are not degraded in the POTW. Those that do not pass through to the receiving waters are removed in the sludge. The presence of highly toxic metals discharged from a battery plant in the POTW sludge may limit a POTW chosen sludge disposal method. For example, a major pollutant discharged by battery plants is cadmium. Under EPA's Criteria for Classification of Solid Waste Disposal Facilities and Practices (40 CFR Part 257), the application of POTW sludge to land used for the production of food-chain crops is restricted when the sludge contains significant concentrations of cadmium.

The mass limitations set forth as PSES are presented here as the only method of designating pretreatment standards. Regulation on the basis of concentration only is not appropriate for this category because flow reduction is a significant part of the model technology for pretreatment. The flow reduction in conjunction with the end-of-pipe technology reduces the amount of toxic pollutants introduced into a POTW. For this reason, the Agency is not promulgating alternative concentration-based pretreatment standards.

To comply with PSES, EPA estimates that total capital investment, above equipment in place, would be $8.20 million and that annual costs would be $4.43 million, including interest and depreciation. Section VIII of the development document explains the basis for these costs. The Agency has concluded that PSES is economically achievable.

The Agency has considered the time for compliance for PSES. Few of the indirect discharge battery manufacturing plants have installed and are properly operating the treatment technology for PSES. Many plants in this and other industries will be installing the treatment equipment suggested as model technologies for this regulation and this may result in delays in engineering, ordering, installing, and operating this equipment. For these reasons, the Agency has decided to establish the PSES compliance date for all facilities at three years after promulgation of this regulation.

As proposed, no PSES are promulgated for the calcium and lithium subcategories because the amount and toxicity of the discharges from these subcategories do not justify developing national standards.

Cadmium Subcategory PSES. EPA is promulgating PSES based on flow reduction, oil skimming, and lime and settle technology. Implementation of PSES will remove 27,325 kilograms (60,241 pounds) per year of toxic metals and 42,730 kilograms (94,203 pounds) per year of other pollutants from estimated current discharges, at a capital cost, above equipment in place, of $0.465 million and a total annual cost of $0.159 million. The Agency projects no plant closures, employment impacts or foreign trade effects and has determined that the standards are economically achievable.

Lead Subcategory PSES. EPA is promulgating PSES based on flow reduction, oil skimming, and lime and settle technology. Implementation of PSES will remove 21,037 kilograms (46,281 pounds) per year of toxic metals and 216,128 kilograms (475,482 pounds) per year of other pollutants from estimated current discharges, at a capital cost, above equipment in place, of $7.121 million and a total annual cost of $4.073 million. The Agency projects no plant closures, employment impacts or foreign trade effects and has determined that the standards are economically achievable.

Several of the regulatory flows used as the basis for PSES changed from the proposed regulation to reflect updated information on plant flows and production and to reflect a more accurate assessment of flow reduction practices within the subcategory. These flows are discussed in Section IX of this preamble and in Section X of the development document. The standards presented in the final PSES regulation reflect these changes.

Leclanche Subcategory PSES. With one exception, EPA is promulgating PSES as proposed with zero discharge of wastewater pollutants. Zero discharge is generally practiced in this subcategory by using dry cleaning techniques or recycle and reuse technologies.

After receiving comments and visiting one foliar plant after proposal, EPA determined that zero discharge was inappropriate for foliar battery production. EPA personnel observed product failures caused by impurities in process water. Plant personnel also provided information which demonstrated that the unique physical dimensions of their product, compared to other Leclanche cells, made them particularly susceptible to failure. After considering the product quality aspects of foliar Leclanche batteries, EPA conclude that a wastewater discharge was required in this application. For foliar batteries only, EPA is promulgating PSES based on water recycle and reuse, oil skimming, and lime, settle, and filter technology. Filtration equipment is in place at the existing foliar battery plant. Implementation of PSES will remove 1,300 kilograms (2,866 pounds) per year of toxic metals and 11,000 kilograms (24,251 pounds) per year of other pollutants from estimated current discharges, at a capital cost, above equipment in place, of $0.063 million and a total annual cost of $0.0315 million. The Agency projects no plant closures, employment impacts or foreign trade effects and has determined that the standards are economically achievable.

Magnesium Subcategory PSES. EPA is promulgating PSES based on the proposed technology which includes recycle and reuse of heat paper production wastewater and lime and settle end-of-pipe treatment for other process wastewaters. Implementation of PSES will remove 97 kilograms (214 pounds) per year of toxic metals and 1,018 kilograms (2,244 pounds) per year of other pollutants from estimated current discharges, at a capital cost, above equipment in place, of $0.041 million and a total annual cost of $0.0175 million. The Agency projects no plant closures, employment impacts or foreign trade effects and has determined that the standards are economically achievable.

Zinc Subcategory PSES. EPA is promulgating PSES based on oil skimming, and lime and settle technology. Implementation of PSES will remove 3,729 kilograms (8,221 pounds) per year of toxic metals and 3,543 kilograms (7,811 pounds) per year of other pollutants from estimated current discharges, at a capital cost, above equipment in place, of $0.506 million and a total annual cost of $0.146 million. The Agency projects no plant closures, employment impacts or foreign trade effects and has determined that the standards are economically achievable.

PSNS: EPA is promulgating PSNS based on end-of-pipe treatment and in-process controls equivalent to that used as the basis for NSPS. The flow allowances for PSNS are also the same as those for NSPS. As discussed under PSES, pass through of the regulated pollutants will occur without adequate pretreatment and, therefore, pretreatment standards are required.

Alternative concentration-based standards are not being promulgated because flow reduction is a significant part of the PSNS technology, also discussed under PSES. As in the case of NSPS, the model technology for PSNS has been modified (see NSPS discussion).

VI. Economic Considerations

A. Costs and Economic Impact

EPA's economic impact assessment is set forth in *Economic Impact Analysis of Effluent Standards and Limitations for the Battery Manufacturing Industry*, EPA (EPA-440/2-84-002). This report details the investment and annual costs for the industry as a whole and for plants covered by the battery manufacturing regulation. The report also estimates the probable economic effect of compliance costs in terms of plant closures, production changes, price changes, employment changes, local community impacts, and imports and exports of battery related products.

EPA has identified 149 facilities that will incur costs as a result of this regulation. Of these 149 facilities, 15 are direct dischargers and 134 are indirect dischargers. Total investment for BAT and PSES is projected to be $9.3 million with annual costs of $5.0 million, including depreciation and interest. These costs are in 1983 dollars and are based on the determination that plants will build on existing treatment.

The costs of implementing the regulations were estimated on a plant-by-plant basis for all of the 149 facilities that discharge wastewater. The cost estimates for all of the subcategories except the lead subcategory were derived by a computerized costing program using 1977 plant data resulting in 1978 dollar estimates which have been updated to 1983. The costing program accounted for plant size and for treatment-in-place to develop an estimate of capital and annual costs, which were grouped by subcategory and summed.

The cost methodology for end-of-pipe treatment used at proposal for the lead subcategory was the same as that used for the other subcategories. Following proposal, many comments were received stating generally that compliance costs were underestimated. This necessitated a complete reevaluation of both in-process and end-of-pipe treatment cost methodology. For estimating end-of-pipe wastewater treatment system costs we used a new computer model. This program uses standard engineering costing procedures and generates treatment system costs that are similar to those used at proposal. The treatment system designs and equipment are the same as those considered at proposal. The model generates costs based on June 1983 dollars.

Based on data collected during site visits we revised some in-plant costs and costing procedures. First, we revised our costs for slow formation in the lead subcategory. During the plant visits conducted since proposal we observed that batteries can be stacked in charging racks and slow-formed. We observed sufficient vertical height in the buildings at visited sites to provide the necessary stacking for slow formation without any need for additional floor space in the formation area. Therefore, the in-plant costs were revised to eliminate new building costs for slow formation. Second, the capital recovery factor has been adjusted to reflect a current interest rate. The cumulative effect of the above changes reduced the overall regulatory compliance costs for the lead subcategory.

For purposes of measuring the economic impacts, the industry was subcategorized by the type of product. The economic impacts were estimated through a microeconomic model which projects the price and output behavior of each major industry segment. It is used, in conjunction with compliance cost estimates, to determine post-compliance price and production levels for each industry segment and for each regulatory option.

A financial profile was developed for each of the plants based on average financial ratios for the industry segment in which the plant competes. The primary variables of interest in analyzing individual plants were profitability, as measured by return on sales and return on investment and the discounted cash flow analysis. Other factors considered in judging the likelihood of closure include the degree of integration, and market characteristics such as the degree of competition and the existence of specialty markets. Given the plant-specific compliance cost estimates, the industry-segment-specific financial ratios, and other factors, the effect on individual plants was projected.

There are no potential plant closures or employment effects projected as a result of this regulation. The Agency does not estimate any disproportionate impact on any specific group of plants. Average compliance cost per unit of production is higher for small plants than for large plants. However, the compliance costs for small plants are not large enough to cause plant closures or bankruptcies. Price increases differ somewhat among the product groups ranging from 0.04 percent for cadmium to 0.3 percent for lead. There are no balance-of-trade effects.

The Economic Impact Analysis assumed a reasonable rate of monitoring, varying by size of plant and flow. However, since the regulatory limits are based on monitoring 10 times a month, we performed a sensitivity analysis including costs associated with this level of monitoring activity. The results showed no significant incremental economic impacts.

The Economic Impact Analysis used baseline production and financial information from the 1978 period, updated to 1983 where necessary. In order to evaluate the incremental effects of this regulation over the OSHA lead standard promulgated in 1978, we performed a sensitivity analysis using the OSHA cost estimates. (See Economic and Environmental Analysis of the Current OSHA Lead Standard, Occupational Safety and Health Administration, 1982.) The effect of the OSHA regulation was to increase the baseline costs of production for plants in the lead subcategory and to cause a large number of plants to close. The economic impact analysis for this regulation was reestimated for the plants expected to remain in operation after the compliance deadline of the OSHA regulation. For each of these remaining plants, compliance costs as a percent of revenues were less than one percent and there would be no additional plant closures as a result of this regulation. Accordingly, the Agency concludes that changes in profits and other economic impacts resulting from this regulation would be negligible.

In addition, EPA has conducted an analysis of the incremental removal cost per pound-equivalent for each of the proposed technology-based options. A pound-equivalent is calculated by multiplying the number of pounds of pollutant discharged by a weighting factor for that pollutant. The weighting factor is equal to the water quality criterion for a standard pollutant (copper), divided by the water quality criterion for the pollutant being evaluated. The use of "pound-equivalent" gives relatively more weight to removal of more toxic pollutants. Thus, for a given expenditure, the cost per pound-equivalent removed would be lower when a highly toxic pollutant is removed than if a less toxic pollutant is removed. This analysis is included in the record of this rulemaking, and is entitled *Cost-Effectiveness Analysis of Effluent Standards and Limitations for the Battery Manufacturing Industry*.

BPT: Fifteen facilities are direct dischargers that will incur costs as a result of this regulation. The cost estimates are based on the regulatory flows and take into account treatment in place. Since the BPT regulatory flow is on the whole larger than the BAT flow, and the in-process controls tend to be relatively inexpensive, the cost of BAT was less than BPT for a number of plants. Thus, for the purpose of evaluating the economic impacts, it was assumed that the plants would install the least expensive treatment to meet the requirements of BPT. Hence, in those cases where the cost of BAT was less than BPT, it was assumed that the lower BAT costs would be incurred to meet the BPT limits and no incremental cost would be incurred in meeting the BAT limits. For this reason, the costs shown here will be different than those shown in the technical section of the preamble. The BPT regulation is projected to cost $0.924 million in investment costs and $0.545 million in annual costs for these plants. The analysis of economic impact concluded that there are no potential plant closures nor job losses associated with BPT treatment option. Total loss in industry production is expected to be about 0.09 percent, with the cost of production increasing about 0.27 percent. If average compliance costs incurred by the plants in the industry were passed on to consumers, price increases would range from 0 to 0.3 percent.

BAT: Compliance costs and resulting impacts discussed below are based on the total effects of going from the BPT costs to the costs incurred to install BAT. Total investment costs are estimated to be $1.1 million, with annual costs of $0.60 million, including depreciation and interest. The incremental costs over BPT are estimated to be $0.20 million in investment costs and $0.05 million in annual costs. BAT would not result in any closures. If the average compliance cost incurred by the plants in the industry were passed on to consumers, price increases would range from 0 to 0.3 percent, not significantly greater than the BPT increases. Thus EPA has determined that BAT is economically achievable.

PSES: 134 facilities are identified as indirect dischargers that will incur costs as a result of this regulation. The pollution control technology for the pretreatment standards is identical to the BAT treatment technology. Investment costs for the 134 indirect discharge facilities are estimated to be $8.2 million and annual costs are estimated at $4.4 million. The Agency's estimate of potential plant closures indicates that there are no potential closures nor employment effects associated with PSES. Total loss in industry production is expected to be about 0.09 percent, with the cost of production increasing about 0.3 percent. Thus the Agency has determined that PSES is economically achievable.

NSPS and PSNS: The industry is expected to grow at a rate close to that of the long-term GNP trend. The rate will differ by subcategory and product type. We analyzed a "normal" plant in the lead subcategory comparing estimated costs for the treatment technologies to expected revenues. In the other subcategories we averaged the costs for existing plants to obtain an estimate for a new plant. The incremental costs over the cost estimates for the BAT and PSES technologies as a percent of expected revenues range from 0.0 percent for Leclanche to 1.8 percent for lithium for the new source plant. The largest subcategory, lead, has an incremental cost of 0.07 percent of expected revenues. EPA does not believe that NSPS and PSNS will constitute a barrier to entry for new sources, or prevent major modifications to existing sources, or produce other adverse economic effects.

B. Executive Order 12291

Executive Order 12291 requires EPA and other agencies to perform regulatory impacts analyses of major regulations. Major rules are those which impose a cost on the economy of $100 million a year or more or have certain other economic impacts. This regulation is not a major rule because its annualized cost of $5.06 million is less than $100 million and it meets none of the other criteria specified in Section I paragraph (b) of the Executive Order. The economic impact analysis prepared for this rulemaking meets the requirements for nonmajor rules.

C. Regulatory Flexibility Analysis

The Regulatory Flexibility Act; 5 U.S.C. 601 et seq. Pub. L. 96-354 requires EPA to prepare an Initial Regulatory Flexibility Analysis for all proposed regulations that have a significant impact on a substantial number of small entities. No regulatory flexibility analysis is required, however, where the head of the Agency certifies that the rule will not have a significant economic impact on a substantial number of entities. The economic impact analysis described above indicates that there will not be a significant impact on any segment of the regulated population, large or small. Accordingly, I hereby certify pursuant to 5 U.S.C. 605(b), that this regulation will not have a significant impact on a substantial number of small entities.

D. SBA Loans

The Agency is continuing to encourage small plants to use Small Business Administration (SBA) financing as needed for pollution control equipment. The three basic programs are: (1) The Pollution Control Bond Program, (2) the Section 503 Program, and (3) the Regular Business Loan Program. Eligibility for SBA Programs varies by industry. Generally, a company must be independently owned, not dominant in its field, the employee size ranges from 250 to 1,500 employees (dependent upon industry) and annual sales revenue range from $275,000 to $22 million (varies by industry). The estimated economic impacts for this category do not include consideration of financing available through these programs.

For further information and specifics on the 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-based debentures that are bought by the Federal Financing Bank, an arm of the U.S. Treasury.

Through SBA's Regular Business Loan 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 Business Loan and Section 503 Programs contact your local SBA Office. The coordinator at EPA headquarters is Ms. Frances Desselle who may be reached at (202) 382-5373.

VII. Nonwater Quality Environmental Impacts

Eliminating or reducing one form of pollution may cause other environmental problems. Sections 304(b) and 306 of the Act require EPA to consider the nonwater quality environmental impacts (including energy requirements) of certain regulations. In compliance with these provisions, we considered the effect of this regulation on air pollution, solid waste generation, water scarcity, and energy consumption. This regulation was circulated to and reviewed by EPA personnel responsible for nonwater quality programs. While it is difficult to balance pollution problems against each other and against energy use, we believe that this regulation will best serve often competing national goals. In particular, the flow reduction aspects of the regulation will in many cases reduce the total discharge of toxic and other pollutants into the environment.

The following nonwater quality environmental impacts (including energy requirements) are associated with the final regulation. The Administrator has determined that the impacts identified below are justified by the benefits associated with compliance with the limitations and standards.

A. Air Pollution

Imposition of BPT, BAT, NSPS, PSES, and PSNS will not create any substantial air pollution problems because the wastewater treatment technologies required to meet these limitations and standards do not cause air pollution.

B. Solid Waste

EPA estimates that battery manufacturing plants generated 18,960 kkg (87,000 tons) of solid wastes per year from manufacturing process operations, and an indeterminate amount of solid waste from wastewater treatment because of the variable technologies currently practiced. These wastes were comprised of treatment system sludges containing toxic metals, including cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc.

EPA estimates that BPT limitations will contribute an additional 8,047 kkg (9,693 tons) per year of solid wastes over the total solid waste levels currently generated. BAT and PSES will increase these wastes by approximately 63,940 kkg (69,492 tons) per year beyond BPT levels. These sludges will necessarily contain additional quantities (and concentrations) of toxic metal pollutants. A new plant with the average industry production level would at NSPS and PSNS generate an estimated 0.06 percent increase in the mass of sludges over BAT and PSES.

The Agency considered the solid wastes that would be generated at battery manufacturing plants by lime and settle treatment technologies and believes that they are not hazardous under Section 3001 of the Resource Conservation and Recovery Act (RCRA). This judgment is made based on the recommended technology of lime precipitation. By the addition of a small excess of lime during treatment, similar sludges, specifically toxic metal bearing sludges generated by other industries such as the iron and steel industry, passed the EP toxicity test. See 40 CFR 261.24 (45 FR 33084 (May 19, 1980)).

Wastes which are not hazardous must be disposed of in a manner that will not violate the open dumping prohibition of Section 4005 of RCRA. The Agency has calculated as part of the costs for wastewater treatment the cost of hauling and disposing of additional wastes generated as a result of these requirements. For more details, see Section VIII of the technical development document.

Only wastewater treatment sludge generated by sulfide precipitation technology, and wastewater treatment sludges containing mercury are likely to be hazardous under the regulations implementing subtitle C of the Resource Conservation and Recovery Act (RCRA). The costs of disposing of sulfide sludges or mercury containing sludges as hazardous were calculated for the Lechlanche and zinc subcategories. See Section VIII of the development document for details. Under those regulations, generators of these wastes must test the wastes to determine if the wastes meet any of the characteristics of hazardous waste (see 40 CFR 262.11, 45 FR 33142–33143, May 19, 1980).

C. Consumptive Water Loss

Treatment and control technologies that require extensive recycling and reuse of water may require cooling mechanisms. Evaporative cooling mechanisms can cause water loss and contribute to water scarcity problems—a primary concern in arid and semi-arid regions. While this regulation assumes water reuse, the overall amount of reuse through evaporative cooling mechanisms is low and the quantity of water involved is not significant. In addition, most battery manufacturing plants are located east of the Mississippi where water scarcity is not a problem. We conclude that the consumptive water loss is insignificant and that the pollution reduction benefits of recycle technologies outweigh their impact on consumptive water loss.

D. Energy Requirements

EPA estimates that the achievement of BPT effluent limitations will result in a net increase in electrical energy consumption of approximately 0.40 million kilowatt-hours per year. The BAT effluent technology are projected to increase electrical energy consumption by 0.34 million kilowatt hours per year. The BAT energy requirements are lower than those at BPT because reducing the flow reduces the pumping requirements, the agitation requirement for mixing wastewater, and other volume-related energy requirements. To achieve the BPT effluent limitations, a direct discharger will increase total energy consumption by less than 0.42 percent of the energy consumed for production purposes. To achieve the BAT limitations, a direct discharger will increase total energy consumption by less than 0.36 percent.

The Agency estimates that PSES will result in a net increase in electrical energy consumption of approximately 4.09 million kilowatt-hours per year. To achieve PSES, an existing indirect discharger will increase energy consumption by less than 0.42 percent of the total energy consumed for production purposes.

The energy requirements for NSPS and PSNS are estimated to be similar to energy requirements for BAT and PSES. More accurate estimates are difficult to make because projections for new plant construction are variable.

VIII. Pollutants and Subcategories Not Regulated

The Settlement Agreement in *NRDC* v. *Train, supra* contains provisions authorizing the exclusion from regulation in certain instances of toxic pollutants and industry subcategories. These provisions have been rewritten in a Revised Settlement Agreement in *Natural Resources Defense Council, Inc.* v. *Train,* 8 ERC 2120 (D.D.C. 1976), *modified,* 12 ERC 1833 (D.D.C. 1979), modified by orders dated October 26, 1982, August 2, 1983, and January 6, 1984.

A. Exclusion of Pollutants

The Agency has deleted the following three pollutants from the toxic pollutant list: (49) trichlorofluoromethane and (50) dichlorofluoromethane, 46 FR 79692 (January 8, 1981); and (17) bis(chloromethyl) ether, 46 FR 10723 (February 4, 1981).

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

Paragraph 8(a)(iii) also allows the Administrator to exclude from regulation toxic pollutants detected in amounts too small to be effectively reduced by technologies known to the Administrator. Appendix D to this notice lists the toxic pollutants in each subcategory which were detected in the effluent in amounts at or below the nominal limit of analytical quantification, which are too small to be effectively reduced by technologies known to the Administrator and which, therefore, are excluded from regulation.

Paragraph 8(a)(iii) also allows the Administrator to exclude from regulation toxic pollutants detectable in the effluent from only a small number of sources within the subcategory because they are uniquely related to those sources. Appendix E to this notice lists for each subcategory the toxic pollutants which were detected in the effluents of only a small number of plants, are uniquely related to those plants, and are not related to the manufacturing processes under study.

Paragraph 8(a)(iii) also allows the Administrator to exclude from regulation, toxic pollutants present in amounts too small to be effectively reduced by technologies known to the Administrator. Appendix F lists those toxic pollutants which are above the level of analytical quantification, but not treatable using technologies considered applicable to the category.

Paragraph 8(a)(iii) also allows the Administrator to exclude from regulation toxic pollutants which will be effectively controlled by the technologies upon which are based other effluent limitations and guidelines, standards of performance, or pretreatment standards. Appendix G lists those metal toxic pollutants which will be effectively controlled by other regulated pollutants in BAT and NSPS, PSES, and PSNS, even though they are not specifically regulated.

B. Exclusion of Subcategories

Paragraph 8(a)(iv) and 8(b)(ii) of the Settlement Agreement authorizes the exclusion of subcategories in which the amount and toxicity of each pollutant in the discharge do not justify developing national regulations. Some subcategories of the battery manufacturing category meet this provision and are excluded from some parts of this regulation. Appendix H lists the subcategories not regulated. The nuclear subcategory is excluded from all regulation since there are no currently operating plants and plans are not being made to resume production. For BPT and BAT, four subcategories are excluded. Currently there are no direct dischargers in the calcium, Leclanche, or magnesium subcategories. The amount and toxicity of direct pollutant discharges (less than 100 lb/yr of toxic pollutants) in the lithium subcategory does not justify developing national regulations. For PSES, two subcategories are excluded. Currently the amount and toxicity of pollutants discharged (less than 100 lb/yr of toxic pollutants) in the calcium and lithium subcategories do not justify developing national regulations.

IX. Public Participation and Response to Major Comments

Industry, government, and environmental groups have participated during the development of these effluent guidelines and standards. Following the publication of the proposed rule on November 10, 1982 in the Federal Register, we provided the development document and the economic impact analysis supporting the proposed rule to industry, government agencies, and the public sector. The public record supporting this regulation was available for public use on November 23, 1982. The comment period ended on January 24, 1983 for all subcategories except the lead subcategory which was extended until February 7, 1983. A permit writers workshop was held on the battery manufacturing rulemaking in Atlanta on January 6, 1983. On January 17, 1983 in Washington, D.C., a public hearing was held on the proposed pretreatment standards at which people presented testimony. A notice of data availability and a request for comment on data obtained after proposal was published in the Federal Register on November 21, 1983 with the comment period ending on December 21, 1983.

Since proposal, 24 commenters submitted over 300 individual comments on the proposed regulation. Comments were received from Continental Battery Manufacturing Corporation; Chloride Inc.; Standard Storage Battery Company; Polaroid Corporation; Old Ironsides, Inc.; Gates Energy Products, Inc.; General Motors Corporation; Atlantic Battery Company, Inc.; Union Carbide Corporation; Battery Council International; GNB Batteries, Gould Inc.; Independent Battery Manufacturers Association Inc.; Natural Resources Defense Council, Inc.; Allied Electronic Components; New Castle Battery Manufacturing Company; EXIDE Corporation; National Electrical Manufacturers Association; General Battery Corporation; Resource Consultants; Globe Battery, Johnson Controls, Inc.; Standard Industries; American Foundry-Men's Society; White Consolidated Industries, Inc.; and the Small Business Administration.

All comments received have been carefully considered and appropriate changes in the regulation have been made whenever data and information supported those changes. Major issues raised by the comments are addressed in this section of the preamble. All comments received and our detailed responses to these comments are included in a document entitled *Response to Public Comments, Proposed Battery Manufacturing Effluent Limitations and Standards* which has been placed in the public record for this regulation.

The following is a discussion of the Agency's responses to the principal comments.

1. Combined Metals Data Base

Comment: Several commenters objected to the use of data from other categories to establish the treatment effectiveness of lime and settle and lime, settle and filtration in the battery manufacturing category. Commenters argued that the primary metals being treated are different and therefore, the data cannot be transferred for treatment of metals found in battery manufacturing wastewater.

Comments specifically directed to the combined metals data base (CMDB) contend that: (1) The data base is too small, (2) data were included improperly, and (3) data not representative of lime and settle technology were included.

Response: The CMDB (revised following proposal of the battery manufacturing effluent limitations and standards) is comprised of 162 data points from 18 plants in five industrial categories with similar wastewater. All of the plants in the data base have the recommended end-of-pipe treatment technology. One of the plants in the data base is a battery manufacturing plant. All of the data were evaluated and analyzed to establish treatment performance concentrations that represent proper operation and maintenance of the technology. The use of data from several comparable categories enhances the estimates of treatment effectiveness and variability over those that would be obtained from data from any one category alone. Our conclusion that the data are applicable across these categories is based on a statistical analysis demonstrating homogeneity among the raw wastewaters of the industrial categories in the CMDB. The statistical methods used to assess homogeneity among the categories in the CMDB and to determine treatment effective concentrations are appropriate and are well known to statisticians.

(1) The methods used to analyze homogeneity are known generally as ananlysis of variance. Effluent limitations were determined by fitting the data to a lognormal distribution and

using estimation techniques that possess desirable statistical properties. These methods are described in detail in the document titled, "A Statistical Analysis of the Combined Metals Industries Effluent Data."

Following proposal of the battery manufacturing effluent limitations and standards, EPA reviewed the CMDB. This resulted in minor additions, deletions and corrections to the data base. Then EPA repeated the analyses performed prior to proposal. The earlier conclusion regarding homogeneity remained unchanged. The new analysis, based on the slightly revised CMDB, did result in slight changes in the treatment effectiveness concentrations for several pollutants. The revisions to the data base and analysis are described in the report "Revisions to Data and Analyses of the Combined Metals Data Base", found in the record of this rulemaking. A separate review and analysis of the data available for the pollutant lead was conducted. This review and analysis is discussed in Comment 3, Treatment Effectiveness Concentration for Lead, found later in this section.

(2) The Agency carefully re-examined the specific data points that commenters identified as being improperly included in the CMDB. These data points fall into two categories: (a) effluent points associated with low pH readings (<7.0 standard units) and (b) influent points associated with larger effluent measurement made on the same day. A detailed analysis of each data point referred to by commenters is provided in the response to comments documents, also found in the record.

EPA generally excluded data from the CMDB in cases where the pH was below 7.0 for extended periods of time (i.e., over two hours). The rationale for this approach was that operation with a low pH over a substantial period of time often leads to an improperly functioning treatment system.

A commenter criticized EPA for retaining in the CMDB several data points for which pH was measured at or below 7.0. The time periods of low pH for these data points cannot be determined from the existing information; however, because large amounts of toxic metals were removed and low effluent concentrations were being achieved, the pH at the point of precipitation necessarily had to be well above pH 7.0. The reason for the effluent pH falling below 7.0 cannot be determined from the available data, but it is assumed to be a result of pH rebound. Rebound is often encountered when a slow reacting acidic material is neutralized or reacts late in the treatment cycle. The Agency believes that the criticized data are representative of a lime and settle treatment process which is being operated in an acceptable manner. Accordingly, the data have been retained in the CMDB. In addition, we note that any error that might be introduced if these data were improperly included in the CMDB would inure to the benefit of the regulated industry, since a low pH would result in less than optimal removal of pollutants.

Commenters also objected to the use of certain effluent data points that exceeded the paired influent data. The occurrence of an influent concentration less than an effluent concentration measured on the same day may be in indication of system malfunction or improper operation. However, such concentrations may be observed in the course of normal operation due to inherent lags in the treatment system. In general, where there was no indication of treatment system malfunction or mislabeling of the sample, the concentrations were retained in the CMDB.

(3) The Agency carefully re-examined the specific data points identified in comments as being from plants without appropriate lime and settle technology. Each plant identified was reviewed carefully to ensure that all data used came from plants with treatment that qualified as lime and settle technology. A discussion of each plant referred to in the comment is contained below in this section.

2. Mass-Based Versus Concentration-Based Limitations and Standards

Comment: Several commenters oppose mass-based limitations and standards and recommend that, as it did in a few other categories, the Agency should establish concentration-based limitations and standards instead. Commenters asserted that production normalized flows, necessary for mass-based limitations and standards, have not and cannot be properly established and that the limitations and standards should therefore be based on concentrations alone. Additionally, mass-based limitations and standards were purported to make compliance determinations unnecessarily complex, if not impossible. For pretreatment standards, commenters contend that mass-based standards are especially inappropriate as most POTW sewer ordinances are concentration-based.

Response: The Agency is promulgating mass-based limitations and standards because flow reduction is an important part of the model treatment technology. In developing this regulation, the Agency examined the sources and amounts of water used and discharged in various process elements. EPA found that for most process elements, a significant number of plants discharged more wastewater than required and further, that for a number of processes, water was being recycled by many plants in the category. In addition, the discharge of wastewater was eliminated in many plants by implementing in-plant controls. Accordingly, flow reduction was incorporated as a part of the model technology for this category. The total BPT discharge flow is estimated to be reduced by 80 percent at BAT, and total reduction of toxic pollutants is 3,420 kilograms (7,523 pounds) per year. Mass-based limitations are necessary in this category for both direct and indirect discharges to ensure adequate control of the total discharge of pollutants and to reflect the total pollutant removal achieved by the model technology.

The production-normalized flows used to establish BAT limitations and PSES have been based on flow and production data obtained from two sources: (a) That provided by industry and (b) that determined by EPA personnel and their representatives during engineering site visits and sampling episodes. Mass-based limitations and standards are not difficult to implement. To determine an individual plant's discharge allowances, in order to implement the mass-based standards, plant personnel will typically provide historical production information to the permitting or control authority which will then apply the mass limitations or standards presented in the regulation using the average rate of production based on consideration of the historical data.

A plant's limitations or standards may be revised if the average rate of production no longer represents a reasonable measure of actual production due to substantial changes in operation or production.

3. Treatment Effectiveness Concentration for Lead

Comment: Commenters objected to the use of the combined metals data base (CMDB) in establishing treatment effectiveness concentrations for the pollutant lead in the lead subcategory. They claimed that EPA had incorrectly classified the battery manufacturing plant that was the source of the lead values used in the determination of treatment effectiveness concentrations for lead at proposal. They contended that the plant was not representative of battery manufacturing, that it is not possible to achieve the proposed limitations and standards based on the lead concentrations from that plant and that the average value used in the electroplating and metal finishing regulation or an even higher value should be applied to this subcategory. One commenter provided a list of a total of eight "well-operated" plants to be used by the Agency as a basis for determining treatment effectiveness concentrations in the lead subcategory.

Response: There were a total of 37 lead values in the CMDB at the time this regulation was proposed; however, the influent and effluent lead values from the battery plant were significantly greater than the values from the other categories. To properly represent the performance achievable by lime and settle for plants in this category, only the lead data from the battery plant were used. Thirty-four data points with lower lead concentrations were thus excluded from the calculation.

The Agency does not believe that it improperly classified the battery plant in the CMDB. EPA believes that the operations present at this plant and the wastewater characteristics are representative of battery manufacturing. This conclusion is based on a comparison of this plant with others in the subcategory, specifically with regard to process elements present, water use and discharge practices. In addition this plant is considered to be representative of a properly operated lime and settle treatment system, which is discussed in comments 5 and 6 of this section.

EPA considered including the metal finishing and electroplating data referred to by the commenter in the CMDB. A statistical analysis indicated, however, that the metal finishing and electroplating data sources were not homogeneous in general with the other industrial categories in the CMDB. The statistical results are consistent with the technical judgment that metal finishing and electroplating wastewaters tend to be different with respect to pollutant concentrations from wastewater generated in the other categories in the CMDB. Therefore, the metal finishing and electroplating data were not included in the CMDB. Consistent with this analysis, the use of the metal finishing and electroplating data are not an appropriate means of determining lime and settle treatment effectiveness concentrations for lead in this subcategory. We note that the metal finishing long-term average for lead is only 0.07 mg/l higher than that used for this regulation.

After proposal, the Agency collected and analyzed additional samples from five lead battery plants. EPA also collected plant-supplied effluent data from thirteen lead battery plants, some of which were also sampled plants. One of these plants supplied over 200 days of daily lead concentrations measured in the untreated and treated wastewater for a lime and settle treatment system. Data from the remaining plants were not suitable to use as a basis for establishing lime and settle treatment effectiveness concentrations because they had filters or had anomalies in their treatment systems as discussed immediately below in comment 4.

We added the new data and re-analyzed the data set, and found that the long term mean concentration remains unchanged. The one day and ten day treatment effectiveness values do change and the limitations and standards promulgated by this rulemaking reflect the change.

4. Consideration of Data From Eight Plants Claimed To be Exemplary

Comment: In various submittals, one commenter suggested that eight plants are exemplary and should be considered in establishing treatment effectiveness concentration for lead battery manufacturing plants.

Response: EPA had visited one of the plants prior to proposal and visited the other seven following proposal. Two (plants A and B) were found to be exemplary L&S plants and were used to develop treatment effectiveness concentrations for lead. The others were not, as discussed below. For purposes of the following discussion, these plants are referred to as plants C–H. Detailed trip reports for each plant have been placed in the administrative record to this rulemaking. First, four plants use filters generally for the primary means of solids removal or as polishing filters. Plant C uses caustic in conjunction with filtration as the primary means of solids removal. Plant D uses lime precipitation and membrane filtration and plants E and F use lime, settle and filtration. These clearly do not represent lime and settle technology. Second, most of these plants had avoidable operational problems.

EPA personnel visited plant E on July 20, 1983. We observed a major deficiency in the operation of the treatment system. The plant had reversed the flow in the clarifier to go in at the bottom and out at the top because they did not want to remove solids from the clarifier as often as they had been. This resulted in the decrease in uniform flow control of the clarifier which decreases optimal time for precipitation and floc formation, and decreased the amount of solids removal from the filter because to varying degrees toxic metals remained in a dissolved state from the clarifier.

We visited and sampled plant F on June 10, 1983, and July 1, 1983, respectively. During the visits we observed two operational problems in the wastewater treatment system which we believe severely affected the overall performance. First, we observed large solids existing the clarifier. This is generally an indication of short circuiting or the need of a coagulant aid (such as iron salts) to enhance the settling properties of the precipitants. Second, the pH of the effluent from the clarifier was being lowered by the addition of sulfuric acid prior to being introduced into the filter. This results in redissolution of the toxic metals and does not represent exemplary operation of technology.

We visited plant D on May 17, 1983. The pH of the lime precipitation at this plant is 7.0 standard units, substantially below the 8.8 to 9.3 pH range at which the best overall removal of the toxic metals, including lead, usually occurs. This plant uses a microfilter following lime precipitation to remove solids. The filter throughput was observed to be four times the design value for the unit. This mode of operation does not represent exemplary practice.

EPA personnel visited and sampled plant G during May of 1983. We observed that the plant did not practice sludge recycle to the clarifier influent or mix tank, a practice that is widespread in this category as well as many others. Recycle of a portion of the sludge is critical in floc formation in the clarifier. This plant's failure to do so limits its ability to effectively remove toxic metals. In addition, this plant was adding polyphosphates to chelate calcium and to prevent it from precipitating in treated wastewater which was reused. The addition of this chemical or any other chelating agent impedes the precipitation and removal of metals including lead. Thus we believe that this caused the high effluent lead concentrations obtained during sampling.

EPA personnel visited and sampled plant C in June of 1983. It was observed during the site visit that the precipitation pH was 7.5 standard units; as stated above, the best overall removal of the toxic metals occurs when the precipitation pH is in the range of 8.8 to 9.3 standard units. Plant personnel have elected to operate at this pH not to optimize toxic metal removals but rather to minimize the alkaline load sent to the POTW.

EPA personnel visited plant H on July 21, 1983. We observed that the precipitation pH of 7.5, like that at plant C was below the expected range for effective toxic metals removal. We also observed a tube settler used for primary solids removal that was laden with solids. The presence of the solids severely impeded the manner in which the tube settler removed toxic metals. We also observed that a clarifier designed to operate on a continuous basis was operated intermittently. This mode of operation clearly does not represent exemplary practice.

5. Definition of Lime and Settle Treatment Technology

Comment: Several commenters stated that the Agency's use of the phrase "lime and settle technology" implied only the use of chemical precipitation with lime followed by sedimentation. The commenters asserted that they provided additional sedimentation capacity and added flocculants (iron based). They contended that even with the addition of these items, which they believe represent a level of technology greater than lime and settle, they could not achieve the proposed limitations and standards.

Response: The phrase "lime and settle" is a short phrase used to describe the state of the art technology using lime (or other alkalis when appropriate) to precipitate and settle metal hydroxides in conjunction with Stokes' Law Sedimentation, and where necessary augmented by the addition of coagulants and flocculants. The model lime and settle technology includes flow equalization and multiple stage pH adjustment to ensure proper control of pH and precipitate formation. Section VII of the Development Document provides a more detailed discussion of this model technology.

As discussed in the response to the next comment, #6—Use of Multiple Settling Ponds and Lagoons—the model technology is based upon any Stokes law sedimentation while a clarifier sized to provide an adequate period of time for precipitants to settle according to Stoke's Law is used for costing.

Some plants use flocculants to enhance settling properties of the metal hydroxide precipitants. This can be achieved in a variety of ways. One unique aspect of some lead battery manufacturing plants is the distribution of iron in process wastewater. Iron was measured in process wastestreams typically at 5 mg/l. Flocculant dosages required for wastewater of this nature would generally not exceed 50 mg/l. EPA is aware of one exemplary plant that adds scrap equipment to their treatment system to provide iron as a flocculant while another adds iron from some underground drainage water that is treated with battery process wastewater.

In those instances where the addition of iron as a flocculant would be required, the increase in the capital cost would be no more than four percent with an eight percent increase in the total annual costs. These costs would not result in additional plant closures, employment impacts or foreign trade effects.

6. Use of Multiple Settling Ponds and Lagoons

Comment: Several commenters reported the use of multiple ponds and lagoons, or ponds and lagoons following mechanical clarifiers to provide sedimentation of metal hydroxide and metal salt precipitants. The commenters contend that either of these scenarios represents a level of technology greater than lime and settle.

Response: The model lime and settle technology is based on Stoke's Law Sedimentation. The Agency has established treatment effectiveness concentrations based on data from plants providing adequate sedimentation, generally, through the use of clarifiers which provide mechanical assistance to Stokes law settling. We believe, however, that single ponds or lagoons or any combination of multiple ponds or lagoons that are designed, operated and maintained to provide adequate settling can be used to achieve these treatment effectiveness concentrations. The number or volume of ponds, lagoons or clarifiers alone is not relevant in determining the adequacy of the settling provided by a particular system. The particle settling velocity as determined by settling tests generally conducted prior to the design of a treatment system is the determining factor when evaluating sedimentation adequacy. The settling device must provide enough time in light of the particle net settling velocity and the distance it must settle. Any additional retention time provided by increasing the settling devices size such as oversizing a clarifier, adding multiple ponds, or any other means will not result in any additional solids removal. Therefore, plants can achieve the treatment effectiveness concentrations by using adequate sedimentation techniques regardless of the number or absolute volume of ponds, lagoons or clarifiers.

7. Consideration of Additional Wastestreams

Comment: Numerous commenters stated that EPA did not account for a variety of wastewater sources at battery manufacturing plants. Specifically they are concerned about wastewaters generated as a result of complying with OSHA regulations (29 CFR 1910.1025) such as handwashing, showers, laundry, respirator wash, and floor wash. In addition, commenters believed that the Agency has overlooked other sources of wastewater such as truck wash, plate soaking, wet air scrubbers, laboratories, pallet washing, cooling tower blowdown, water softener and deionizer backflush.

Response: As a result of numerous comments that EPA overlooked a variety of wastewater sources at battery manufacturing plants, the Agency gathered additional information in the form of an industry survey and 17 site visits.

The OSHA regulations do not require specific water use but rather establish a lead standard that requires employers to control exposure to airborne lead within a plant based on the established lead permissible exposure limit (PEL), and to make blood sampling and analysis monitoring available for their employees. To achieve this, plants generally require handwashing, showers, wearing of work uniforms, wearing respirators, and frequent floor wash to control particulate lead. Floor wash was included as a process waste stream at proposal, but flows were reevaluated following receipt of comments. Floor wash is further discussed under comment 8 of this section.

The use of such "mechanisms" can generate wastewater. The Agency does wish to point out that there are a few plants that are clean enough to keep their lead air limits low enough so as not to need to generate wastewater in order to meet OSHA requirements.

The commenter is concerned about wastewater streams generated due to compliance with OSHA regulations. In addition to the OSHA-related activities, other sources of wastewater were addressed in the comments, such as truck wash, laboratories, plate soaking, wet air scrubbers, pallet washing, cooling tower blowdown, water softener and deionizer backflush, and other streams. Each of these potential waste streams is discussed below.

• Handwash, respirator wash, laboratories and wet air scrubbers are additional streams which have been given a discharge allowance. Discharge allowances for these four streams are added to the discharge allowances for floor wash and battery repair because all of these activities occur at almost all lead plants, and by being combined into a miscellaneous group, facilitate administration. If a plant has any one of these streams, then the plant receives the entire miscellaneous waste stream allowance. Any other streams, for which an allowance is provided, will be addressed on a stream-specific basis.

Laundry. Information on laundry activity was obtained for all sites visited since proposal. Most plants do not have on-site laundries. One of the on-site laundries treats water on-site; the others discharge to a sanitary sewer without treatment. Laundry discharge flows were obtained during sampling visits. These data support a discharge allowance for on-site laundering of work uniforms. A production normalized regulatory flow of 0.109 l/kg of total lead used has been established for this waste stream at BPT, BAT, PSES, NSPS, and PSNS.

Showers. Industry comments on the proposed regulations suggested that employee shower water is a stream which should have a discharge allowance. Plants have reported various hydraulic loadings per shower; one plant reported as high as 20 minutes water flow per person.

During plant sampling after proposal, the Agency was unable because of mechanical limitations to collect wastewater samples for chemical analysis and measure water flow from showers. However, plant practices relative to employee showering were observed and discussed with plant management. On the basis of this examination, it appears that shower water from most employee showers contains little or no lead and may therefore be discharged as sanitary wastewater. Only if employees are exposed to high lead dust levels (*i.e.*, work in areas where their airborne exposure to lead is above the PEL) and also carry this dust into the showers can this wastewater contain substantial amounts of lead. Even for the relatively few employees working in high lead dust exposure areas, the amount of lead carried into the shower is minimal when protective clothing, including hair coverings, have been used and exposed body areas such as hands and arms have been washed on leaving the production area (before entering the shower). These are standard industry practices. Therefore, shower water can be discharged to a sanitary sewer provided employees always wash their hands when leaving the production area, and employees working in high lead dust areas wear protective clothing and hair coverings (all of which have been laundered or disposed of properly).

EPA has determined that no flow allowance should be provided for showers. For these employees that are exposed to high lead dust levels, adequate means are available for assuring that substantially all lead is removed prior to showering. There is thus no need for a plant to discharge shower wastewater as process wastewater (*i.e.*, as water that has contacted and become contaminated with substantial amounts of lead). The shower wastewater can then be discharged as sanitary wastewater.

Respirator Wash. The new data collected since proposal support a discharge allowance for respirator wash water. Of the sites visited, about half treat wash water on-site before discharge and half discharge to the sanitary sewer without treatment. The observed methods used for respirator wash were varied. Washing techniques included rinsing in lab sinks, laundering in conventional clothes washing machines, and sanitizing in more sophisticated machinery specifically devoted to respirator washing such as "Wavicide" machines. A production normalized regulatory flow of 0.006 l/kg of total lead used has been established for this waste stream at BPT, BAT, PSES, NSPS, and PSNS.

Hand Wash. The sampling data collected since proposal support a discharge allowance for employee hand wash within the production area. Of the sites visited, most discharge to a sanitary sewer without treatment and some treat on-site before discharge. A production normalized regulatory flow of 0.027 l/kg of total lead used has been established for this waste stream at BPT, BAT, PSES, NSPS, and PSNS.

Truck Wash. The new data support a discharge allowance for truck wash wastewater in both the battery manufacturing and nonferrous metals manufacturing categories. EPA observed that trucks are used to transport used batteries in connection with battery cracking (secondary lead subcategory of the Nonferrous Metals Category) processes. Trucks are also used to transport batteries for various purposes related to battery manufacturing operations. The truck wash discharge allowance for the lead subcategory of battery manufacturing applies only to those sites without an associated on-site secondary lead smelting plant. Truck washing at sites that have battery cracking or secondary lead smelting are addressed by the Agency under the nonferrous metals manufacturing regulation. Equivalent discharge allowances for truck wash are promulgated under the two regulations.

Both sampling data collected at visited plants and flows obtained from commercial truck washing operations were averaged in calculating the normalized flow for this operation. A flow of 0.014 l/kg lead in trucked batteries has been established for this operation, and is to be used in calculating discharge allowances for existing sources. A flow of 0.004 l/kg is established for new sources based on using recycled water to wash the trucks. Trucked batteries are batteries moved into or out of the plant by truck when the truck is actually washed in the plant to remove residues left in the truck from the batteries.

Laboratories. The new data collected since proposal support a discharge allowance for wastewater discharged from on-site laboratory facilities. Information was obtained for all sites visited and all sites are assumed to have on-site laboratories for regulatory purposes.

The laboratory tests performed at the battery plants which generate water were found to be very similar from plant to plant. Also observed at some plants was that the lead samples taken for quality control are reclaimed for their lead value. Based on this practice, lead loadings in the discharge water to treatment should mostly be due to lab instrument washing and dumping electrolyte from battery teardown.

A production normalized regulatory flow of 0.003 l/kg of total lead used has been established for the wastewater generated by on-site laboratories. The laboratory discharge allowance has been combined with the OSHA-related process stream allowance to provide a single total allowance available to any plant performing any of these operations.

Plate Soaking. The Agency received comments from lead battery manufacturers which stated that the acid used for soaking thick (industrial battery) plates could be reused only for plate soaking, but eventually needed to be discharged. Plate soaking is generally done for plates that are more than 2.5 mm (0.10 in) thick. The Agency has established a flow allowance of 0.02 l/kg of lead used based on industry supplied data.

Wet Air Scrubber. The Agency has established an allowance for wet air pollution control scrubbing blowdown which is adequate for any wet scrubber applications mentioned by the commenter. The regulatory flow is based on a model technology typical of that used. This model incorporated production normalized flow data obtained in the industry surveys, on-site plant visits, and from vendor information for the scrubber types used. EPA observed that most plants have no more than two wet scrubber operations on-site. Therefore, an allowance of twice the average of the wet scrubber discharge has been established as part of the miscellaneous allowance. The complete wet scrubber component of this allowance is 0.011 l/kg of total lead used.

Pallet Washing. The Agency recognizes that some plants find it necessary to wash pallets at battery manufacturing facilities. When this is the case, the plants can reuse treated wastewater effluent for this operation and EPA recognizes that they do so. Therefore, a regulatory flow for pallet washing is not necessary and no allowance has been made for this activity.

Cooling Tower Blowdown. Cooling towers have been observed to be used at lead battery plants to cool recirculating noncontact (nonprocess) cooling water. This cooling is usually performed indirectly. Therefore, any blowdown from this operation is usually as a result of non toxic salt concentration buildup. Very few plants were observed to discharge this water to on-site treatment. There is no allowance for this stream.

Water Softener and Deionizer Backflush. Water softeners or deionizers are used at some lead battery plants to upgrade the quality of service water or for electrolyte formulation. Concentrations of minerals contained in city or groundwater is incurred resulting in the need to backflush the filters. As this is a nonprocess stream, no allowance is promulgated.

Other Plant Sources of Wastewater. Leachate from an on-site inactive landfill, storm water runoff, and effluent from a sludge dewatering facility (processing sludges from other facilities) are not covered by this categorical regulation. These wastewaters are best regulated by the permit writer on a case-by-case basis.

In conclusion, the Agency firmly believes that recycle and reuse of certain wastewaters generated by manufacturing operations is feasible. When the water cycle within a plant is carefully studied and designed, significant reductions in final water discharge can be achieved. The most significant factor in this reduction can be the reuse of water which the plant has treated on-site.

8. Adequacy of Flow Allowances

Comment: Several commenters asserted that EPA had not adequately considered certain process wastewater flows for the processes considered at proposal and has therefore established inappropriate regulatory flows for certain process wastewater streams. Specifically, they are concerned about the no discharge allowance for leady oxide production, pasting, curing, formation, and floor wash. Also, the commenters submitted somewhat larger regulatory flows which they recommended be used in lieu of those established by the Agency.

Response: The Agency does not agree with the commenters' contention that specific regulatory flows are not adequate to address the lead battery manufacturers' needs. After proposal, flows were measured at a number of sites for all process elements using the most accurate procedures available. Flows were also characteristic of the performance within the specific elements.

The Agency does not agree with the commenters' contentions that the establishment of a no discharge allowance for certain process elements is either infeasible or would result in unacceptable process changes. The commenter's concerns in the areas of leady oxide production, pasting, plate curing, formation, and floor wash are addressed individually below.

Leady Oxide Production. The Agency did not base the discharge allowance for leady oxide production on any particular process, but rather upon data related to production that was submitted by industry and collected during visits to plants. The sources of discharges were from operations such as leakage and shell cooling on ball mills, cooling for oxide grinding, and wet scrubbers for air pollution control. Plants can perform such operations using only noncontact cooling water, recycle of this water, and dry bag houses for air pollution control, and therefore produce no wastewater. The Agency believes that a zero discharge allowance for this operation is appropriate.

Pasting. After the receipt of public comments on flows from pasting operations, the Agency gathered additional information on for pasting washdown. Washdown is a required procedure because different paste formulations may be used on any one pasting line, and the equipment must be periodically cleaned. EPA does not believe that the data collected support the claim in comments that pasting machine and pasting area washdown water cannot be recycled because it does not meet paste formulation engineering specifications. During site visits after proposal we observed that many plants did not discharge pasting machine and pasting area washdown water. In fact, complete recycle and reuse of pasting machine and pasting area washdown water is achieved at 57 lead battery manufacturing plants. This operation is inherently a net water consumer, and as such, recycle of this water is advantageous from a water balance point of view. Many plants recycling this wastewater provide sedimentation to reduce pollutant loading in the recycle water. Typically, the settled solids are then reused in the process or sent to a lead smelter. Based on flow information reported by plants and practices observed during site visits, a discharge allowance for pasting machine and area washdown is not necessary.

Curing. With respect to curing, the Agency wishes to point out that by establishing a zero discharge allowance for plate curing operations, EPA is not dictating a particular technology or requiring the use of dry curing as the commenter claims. Agency personnel have observed and documented the curing of plates in curing ovens (humidity-temperature controlled rooms) and in steam chambers without generating a wastewater discharge. Hence the Agency believes that any plant may use any plate curing system under this regulation. With regard to the commenter's assertion that zero discharge from certain process elements will result in a loss of competitiveness due to product quality, the Agency points out that 87 of 97 plants reporting data for plate curing are currently achieving zero discharge from this operation and are competing successfully in the marketplace. Therefore, the Agency concludes that the establishment of a zero discharge allowance for plate curing operations will not impair product quality. Furthermore, the Agency wishes to reiterate that EPA is not dictating a process change as the basis of this zero discharge allowance.

Formation. Following the collection of new data, no discharge allowance is supported for single-fill, double-fill and fill and dump formation processes. Controlled charging rates preclude the necessity for cooling water in closed formation processes. Automatic fillers control overfilling spills. Dumped acid, other acid spills and battery rinse water can be reused.

Information collected supported a discharge allowance for open formation dehydrated batteries. Comments received on open formation wet batteries support a discharge allowance because all the acid used in formation cannot be used for acid cutting. The Agency has established a discharge allowance of 0.053 l/kg of lead used based on industry supplied data.

Floor Wash. The new data collected since proposal continue to support a discharge allowance for floor wash for

BPT, but also supports a discharge allowance at BAT, PSES, NSPS, and PSNS. This allowance is for floor wash water outside of the pasting and formation areas. Floor washing is done at many more plants than had previously reported this procedure. Usually floor washing is done to control airborne lead. Information was obtained from all sites visited. Wastewater discharges from floor wash machines contain high concentrations of lead and may need to be settled or filtered prior to treatment to recover particulate lead and reduce loadings on the treatment system.

The information supplied in the industry survey responses and data collected during sampling visits were considered in establishing the discharge allowance for this operation. A production normalized regulatory flow of 0.01 l/kg, based on the use of power scrubbers, has been established for floor washing at BAT, PSES, NSPS, and PSNS. The flow allowance at BPT is 0.13 l/kg of total lead used, based on all wash down techniques employed. The BPT allowance was based on the average of data submitted by plants in the 1976 data collection portfolio (dcp).

Plants primarily used buckets, mops, hoses, and other manual floor cleaning methods which EPA recognizes make it difficult to carefully control water use and discharge. The BAT allowance is the average production normalized flow of plants which used power floor scrubbers to clean floors outside of the pasting and formation areas.

9. Transfer of Process Elements From Other Industrial Categories

Comment: Several comments pointed out that there were processes integral to the manufacture of lead batteries that were being addressed by EPA as part of other industrial point source categories. They requested that the discharges from these operations when associated with battery manufacturing be specifically addressed in the lead battery manufacturing subcategory.

Response: Regulations for several unit proesses found at battery manufacturing plants are being transferred to this category from two other industrial categories. Grid casting, continuous (direct chill) casting of lead, and melting furnaces as they apply to battery manufacturing are addressed here rather than in regulations for the metal molding and casting category. The wastestreams associated with these unit processes are die casting wet air pollution control, mold release preparation, direct chill casting contact cooling water and lead melting furnace wet air pollution control.

Lead rolling performed in conjunction with direct chill casting at lead battery manufacturing plants is considered here rather than in connection with the nonferrous metals forming category. EPA is aware of five battery manufacturing plants with lead rolling; however, there is no discharge of wastewater from the lead rolling processes at these plants. Accordingly, there are no limitations and standards for this unit process promulgated today. The Agency does recognize that a discharge may be necessary for this unit process for other plants and there is guidance provided in the development document.

10. Membrane Technology

Comment: Commenters contended that reverse osmosis, which was a part of the proposed model treatment technology for NSPS in the lead subcategory, is not demonstrated in the subcategory and is not readily transferable from other categories or subcategories. Commenters also pointed out that reverse osmosis technology could not adequately treat all of the waste streams at a lead battery plant. They stated that the technology would be plagued by operational problems due to its sensitivity to temperature, pH, acidity, chloride concentrations and blinding.

Response: Agency personnel observed that at least two lead battery plants were experimenting with or had considered using reverse osmosis during site visits made after proposal. One plant demonstrated use of a microfiltration unit on wastewater in the lead subcategory. The plant did not experience major membrane blinding or maintenance. The technology has also been demonstrated on a full scale basis for coal mine drainage which has a high sulphuric acid content and high levels of dissolved metals.

We agree with the commenters that reverse osmosis may not adequately treat all lead battery wastewater discharges. We believe that a combination of filtration and reverse osmosis for the less concentrated waste streams can be used. The reverse osmosis brine and other more concentrated wastes could then be treated using lime, settle and filtration.

While we recognize that elevated temperature, acidity pH and chloride concentrations can adversely affect the performance of reverse osmosis technology, all of these operational problems can be avoided through waste stream segregation.

11. Consideration of Sulfide Precipitation for NSPS in the Lead Subcategory

Comment: Several commenters asserted that sulfide precipitation proposed as a part of NSPS for the lead subcategory was not demonstrated in the subcategory.

Response: Sulfide precipitation was considered for NSPS in the lead subcategory during this rulemaking but was ultimately rejected because the incremental removal brought about by the addition of sulfide precipitation to lime, settle and filtration would be insignificant. However, in the zinc subcategory we have based NSPS on sulfide precipitation as discussed above in Section V.

12. Classification of Solid Waste and Disposal Costs

Comment: Commenters in the lead subcategory asserted that sludges emanating from lime and settle treatment systems were sometimes determined to be hazardous and should be classified as hazardous for the purposes of cost estimation. One commenter submitted extraction procedure results showing a portion (six of 36) of the sludges tested to be hazardous. The commenter concluded that the results provided sufficient proof that the sludges were hazardous and should be considered as such for estimating the cost of the regulation.

Response: EPA personnel visited this plant after proposal and confirmed through analysis of sludges and conversations with plant personnel that excess lime was not added to the treatment system. In the proposed regulation, the Agency stated that when 10 percent (or more) excess lime is used in a wastewater treatment system it has been observed that the sludges have not been found to be hazardous. Our cost estimates included costs for a ten percent excess of lime. We reviewed the delisting petitions that formed the basis of our original judgments and reconfirmed our judgments. The marginal nature of the EP test failures and the absence of excess lime in the treated sludge did in no way refute the conclusion used at proposal. Accordingly, lime and settle sludges were considered as nonhazardous for estimating compliance costs.

The Agency also performed an economic analysis using the normal plant and ten representative plants and assuming hazardous waste costs for the wastewater treatment sludges. No closures would result if all wastewater treatment sludges were assumed hazardous.

13. Compliance Cost Estimates

Comment: Many commenters stated the Agency had substantially underestimated the costs of achieving the proposed BAT and PSES in the lead subcategory. They asserted that the Agency failed to account adequately for costs associated with wastewater flow reductions and end-of-pipe treatment.

Response: The Agency carefully considered these comments and in some instances has modified the methods used to estimate in-plant and end-of-pipe treatment costs. As such, EPA has recalculated the cost of compliance with the regulation for the lead subcategory. This was deemed necessary due to:

(1) Changes in discharge allowances, and consequently treatment system size,

(2) Changes in in-plant flow reduction costing procedures due to practices observed in plants since proposal, and

(3) Revisions in the capital recovery factor to reflect a current interest rate.

The model wastewater treatment technology options used are the same as those considered at proposal (except for new sources—see preamble discussion of NSPS in Section V.C. above.

A new computer model for estimating end-of-pipe wastewater treatment systems costs for the lead subcategory was used. The model uses standard engineering costing procedures and generates treatment system costs that are similar to those used at proposal. The model generates costs based on June 1983 dollars. Capital and annual compliance costs were calculated for each plant within the subcategory known to discharge wastewater. Production, actual plant flows, and treatment-in-place were determined from the dcp, a site visit, or the post-proposal survey (whichever was the most recent and accurate information). At BPT, the BPT regulatory flow or the actual flow for a waste stream was used, whichever was the lesser. The same was true for choosing the BAT and PSES flows for each plant. The methodology for costing is described in detail in Section VIII of the development document. In general, the Agency believes that this costing methodology provides a much more accurate, though generally comparable, estimate of plant-by-plant compliance cost.

The major change in the costing methodology pertains to in-plant process costs. In-plant costs included in the compliance cost calculation include:

- Paste machine and area washdown water recycle
- Steam and humidity curing water recirculation
- Slow formation
- Product rinse water reuse
- Power floor scrubber water settling
- Countercurrent rinsing
- Pump seal water recycle
- Hose washdown water recycle
- Segregation of nonprocess water streams
- Formation area wet air pollution control water recycle
- Pasting area wet air pollution control water neutralization

This list is much more inclusive than that used at proposal and provides for the cost of more specific pieces of equipment. These include more complete costs of equipment necessary to perform recycle than included at proposal.

In addition, EPA determined that the costs for slow formation of batteries were over-stated because additional building space was unnecessarily included. EPA observed that batteries can be stacked in charging racks and slow-formed using existing floor space. We observed batteries stacked in racks as high as 15 batteries high, and at all the visited sites we observed sufficient vertical height in the building to provide the necessary stacking for slow formation in a six high stack. Because batteries can be successfully formed when stacked in racks, the claimed need for additional floor space in the formation area appears to be unsupported. Therefore, the in-plant costs were revised to eliminate new building costs for slow formation, but maintain a suitable cost for retrofit of racks.

Some commenters claimed that charging in racks might pose a fire or electrical shock hazard. This potential hazard appears to be adequately controllable, as indicated by the fact that other plants were observed using racked charging without apparent difficulty.

In addition to these observations, the Agency examined all available information on formation procedures. EPA is aware of controlled-amperage formation procedures that can charge batteries in less than a day, and, in some cases, in less than one shift. These formation operations can use air cooling and do not require any additional floor area or extensive equipment costs, such as for additional rectification. Additional circuits in parallel do not require increased voltage and consequently more rectifiers.

EPA has revised its cost estimation to include costs for recycle systems for the following operations:

- Paste mixing and application area wash water recycle,
- Humidity curing water recycle,
- Sealant water recycle, and
- Formation area wet air pollution control water recycle.

As discussed in the response to comment 7 (above) the Agency has maintained a regulatory flow of zero for plant curing for BPT and BAT. Costs have been included to install equipment to provide a zero discharge design for plants which specify steam curing and a discharge to treatment. These costs include pressure relief valves to divert superheated steam flow above the water seal level to prevent any significant condensation.

The Agency believes that the cost of compliance with this regulation for the lead subcategory is an accurate representation of the actual compliance costs that will be incurred by the industry.

14. Discharge of Wastewater From the Manufacturing of Foliar Batteries in the Leclanche Subcategory

Comment: One commenter contended that a wastewater discharge was required from the manufacturing of foliar-type Leclanche batteries.

Response: EPA personnel visited the plant operated by the commenter in addition to two others manufacturing this type of battery to obtain additional information and data. We saw examples and heard explanations of how impurities impair the quality of the product. Plant personnel also provided information which demonstrated that the unique physical dimensions of their product, compared to other Leclanche cells, made them particularly susceptible to failure. After consideration of this new information, we concluded that a wastewater discharge was required in this application. Accordingly, the Leclanche subcategory standards have been revised to account for such a discharge.

X. Best Management Practices

Section 304(e) of the Clean Water Act gives the Administrator authority to prescribe "best management practices" (BMP). EPA is not promulgating BMP specific to battery manufacturing.

XI. Upset and Bypass Provisions

A recurring issue of concern has been whether industry guidelines should include provisions authorizing noncompliance with effluent limitations during periods of "upset" or "bypass." An upset, sometimes called an "excursion," is an unintentional noncompliance occurring for reasons beyond the reasonable control of the permittee. It has been argued that an upset provision in EPA's effluent limitations is necessary because such upsets will inevitably occur even in properly operated control equipment. Because technology-based limitations require only what technology can achieve, it is claimed that liability for such situations is improper. When confronted with this issue, courts have disagreed on whether an explicit upset or excursion exemption is necessary, or whether upset or excursion incidents may be handled through exercise of EPA's enforcement discretion. Compare *Marathon Oil Co.* v. *EPA*, 564 F.2d 1253 (9th Cir. 1977) with *Weyerhaeuser Co.* 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).

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

We determined that both upset and bypass provisions should be included in NPDES permits and have promulgated permit regulations that include upset and bypass permit provisions. See 40 CFR 122.41. The upset provision establishes an upset as an affirmative defense to prosecution for violation of technology-based effluent limitations. The bypass provision authorizes bypassing to prevent loss of life, personal injury, or severe property damage. Consequently, although permittes in the battery manufacturing industry will be entitled to upset and bypass provisions in NPDES permits, this final regulation does not address these issues.

XII. Variances and Modifications

Upon the promulgation of this regulation, the appropriate effluent limitations must be applied in all Federal and State NPDES permits thereafter issued to direct dischargers in the battery manufacturing industry. In addition, on promulgation, the pretreatment limitations are directly applicable to any indirect dischargers.

For the BPT effluent limitations, the only exception to the binding limitations is EPA's "fundamentally different factors" variance. See *E. I. duPont deNemours* & *Co.* v. *Train*, 430 U.S. 112 (1977); *Weyerhaeuser Co.* v. *Costle, supra*. This variance recognizes factors concerning a particular discharger that are fundamentally different from the factors considered in this rulemaking. However, the economic ability of the individual operator to meet the compliance cost for BPT standards is not a consideration for granting a variance. See *National Crushed Stone Association* v. *EPA*, 449 U.S. 64 (1980). Although this variance clause was set forth in EPA's 1973 to 1976 industry regulations, it is now included in the NPDES regulations and will not be included in the battery manufacturing or other industry regulations. See the NPDES regulations at 40 CFR Part 125, Subparts A and D, 45 FR 14166 et seq. (April 1, 1983) for the text and explanation of "fundamentally different factors" variance.

The BAT limitations in this regulation also are subject to EPA's "fundamentally different factors" variance. In addition, BAT limitations for nonconventional pollutants are subject to modifications under Sections 301(c) and 301(g) of the Act. These statutory modifications do not apply to toxic or conventional pollutants. According to Section 301(j)(1)(B), applications for these modifications must be filed within 270 days after publication of final effluent limitations guidelines. (See 43 FR 40859 (September 13, 1978).)

The economic modification section of the Act (Section 301(c)) gives the Administrator authority to modify BAT requirements for nonconventional pollutants [1] for dischargers who file a permit application after July 1, 1978, upon a showing that such modified requirements will (1) represent the maximum use of technology within the economic capability of the owner or operator and (2) result in reasonable further progress toward the elimination of the discharge of pollutants. The environmental modification section (301(g)) allows the Administrator, with the concurrence of the State, to modify BAT limitations for nonconventional pollutants from any point source upon a showing by the owner or operator of such point source satisfactory to the Administrator that:

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

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

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

Section 301(j)(1)(B) of the act requires that application for modifications under Section 301 (c) or (g) must be filed within 270 days after the promulgation of an applicable effluent guideline. Initial applications must be filed with the Regional Administrator and, in those States that participate in the NPDES Program, a copy must be sent to the Director of the State program. Initial applications to comply with 301(j) must include the name of the permittee, the permit and outfall number, the applicable effluent guideline, and whether the permittee is applying for a 301(c) or 301(g) modification or both.

Indirect dischargers subject to PSES and PSNS are eligible for credits for toxic pollutants removed by POTW. See 40 CFR 403.7 48 FR 9404 (January 28, 1981). New sources subject to NSPS are not eligible for any other statutory or regulatory modifications. See, *E. I. duPont de Nemours & Co.* v. *Train*, supra.

Indirect dischargers subject to PSES have, in the past, been eligible for the "fundamentally different factors" variance. See 40 CFR 403.13. However, on September 20, 1983, the United States Court of Appeals for the Third Circuit held that "FDF variances for toxic pollutants are forbidden by the Act," and remanded 403.13 to EPA. *NAMF et al.* v. *EPA*, Nos. 79-2256 et al. (3rd Cir., September 20, 1983). EPA is considering the effect of that decision. Since the opinion addressed only the availability of FDF variances for PSES toxic pollutants, however, "fundamentally different factors" variances for nonconventional pollutants remain available to indirect dischargers. The Agency will soon amend 40 CFR 403.13 in accordance with the court's opinion.

In a few cases, information which would affect these PSES may not have been available to EPA or affected parties in the course of this rulemaking. As a result it may be appropriate to

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

issue specific categorical standards for such facilities, treating them as a separate subcategory with more, or less, stringent standards as appropriate. This will only be done if a different standard is appropriate because of unique aspects of the factors listed in Section 304(b)(2)(B) of the Act: the age of equipment and facilities involved, the process employed, the engineering aspects of applying control techniques, nonwater quality environmental impacts (including energy requirements) or the cost of required effluent reductions (but not of ability to pay that cost).

Indirect dischargers and other affected parties may petition the Administrator to examine those factors and determine whether these PSES are properly applicable in specific cases or should be revised. Such petitions *must* contain specific and detailed support data, documentation, and evidence indicating why the relevant factors justify a more, or less, stringent standard, and must also indicate why those factors could not have been brought to the attention of the Agency in the course of this rulemaking. The Administrator will consider such rulemaking petitions and determine whether a rulemaking should be initiated.

XIII. Implementation of Limitations and Standards

A. Relationship to NPDES Permits

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

One issue that warrants consideration is the effect of this regulation on the powers of NPDES permit-issuing authorities. The promulgation of this regulation does not restrict the power of any permitting authority to act in any manner consistent with law or these or any other EPA regulations, guidelines, or policy. For example, even if this regulation does not control a particular pollutant, the permit issuer may still limit such pollutant on a case-by-case basis when limitations are necessary to carry out the purposes of the Act. In addition, to the extent that state water quality standards or other provisions of State or Federal law require limitation of pollutants not covered by this regulation (or require more stringent limitations on covered pollutants), such limitations must be applied by the permit issuing authority.

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

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" is a written request, submitted by an indirect discharger or its POTW, for a determination of which categorical pretreatment standard applies to the indirect discharger. This assists the indirect discharger in knowing which PSES or PSNS limits it will be required to meet. See 40 CFR 403.6(a).

A "baseline monitoring report" is the first report an indirect discharger must file following promulgation of an applicable standard. The baseline report includes: an identification 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 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 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 provide the 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 conform to the methods outlined in the regulations. See 40 CFR 403.12(e).

Indirect dischargers subject to PSES may obtain "fundamentally different factors" variances for nonconventional pollutants. See Section XII of this preamble.

INDIRECT DISCHARGERS SCHEDULE FOR SUBMITTAL AND COMPLIANCE

Item	Applicable sources	Date or time period	Measured from—	Submitted to—
Request for Category Determination	Existing	60 days or	From effective date of standard	Director.[1]
		60 days	From Federal Register Development Document Availability	Do.[1]
	New	Prior to commencement of discharge to POTW.		
Baseline Monitoring	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	Do.[2]
	New	do	From commencement of discharge to POTW	
Periodic Compliance Reports	All	June and December		Do.[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.

XIV. 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 the "Development Document for Effluent Guidelines, New Source Performance Standards and Pretreatment Standards for the Battery Manufacturing Point Source Category." Volume I includes the cadmium, calcium, Leclanche, lithium, magnesium, and zinc subcategories, and Volume II includes the lead subcategory. The Agency's economic analysis is presented in "Economic Impact Analysis of Effluent Limitations and Standards for the Battery Manufacturing Industry." A summary of the public comments received on the proposed regulation is presented in a report "Responses to Public Comments, Proposed Battery Manufacturing Effluent Limitations Guidelines and Standards," which is a part of the public record for this regulation. Copies of the technical and economic documents may be obtained from the National Technical Information Service, Springfield, Virginia 22161, (703) 487–4600. Additional information concerning the economic impact analysis may be obtained from Ms. Ellen Warhit, Economic Analysis Staff (WH-586), U.S. Environmental Protection Agency, 401 M Street, SW., Washington, D.C. 20460 or by calling (202) 382–5381. Technical information may be obtained by writing to Ms. Mary Belefski, Effluent Guidelines Division (WH-552), U.S. Environmental Protection Agency, 401 M Street, SW., Washington, D.C. 20460 or by calling (202) 382–7153.

This regulation was submitted to the Office of Management and Budget for review as required by Executive Order 12291. This rule does not contain any information collection requirements subject to OMB review under the Paperwork Reduction Act of 1980 44 U.S.C. 3501 *et seq.*

XXIV. List of Subjects in 40 CFR Part 461

Primary batteries, dry and wet, Storage batteries, Battery manufacturing, Water pollution control, Waste treatment and disposal.

Dated: February 27, 1984.

William D. Ruckelshaus,

Administrator.

XVI. Appendices

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

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.

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).

Dcp—Data collection portfolio.

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

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

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

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

POTW—Publicly owned treatment works.

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

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

Appendix B—Toxic Pollutants Limited by This Regulation

A. Subpart A—Cadmium Subcategory

118 Cadmium
124 Nickel
126 Silver
128 Zinc

B. Subpart B—Calcium Subcategory

116 Asbestos
119 Chromium

C. Subpart C—Lead Subcategory

120 Copper
122 Lead

D. Subpart D—Leclanche Subcategory

123 Mercury
128 Zinc

E. Subpart E—Lithium Subcategory

119 Chromium
122 Lead

F. Subpart F—Magnesium Subcategory

119 Chromium
122 Lead
126 Silver

G. Subpart G—Zinc Subcategory

119 Chromium
121 Cyanide
123 Mercury
124 Nickel
126 Silver
128 Zinc

Appendix C—Toxic Pollutants Not Detected

(a) Subpart A—Cadmium Subcategory

001 Acenaphthene
002 Acrolein
003 Acrylonitrile
004 Benzene
005 Benzidine
006 Carbon tetrachloride (tetrachloromethane)
007 Chlorobenzene
008 1,2,4-trichlorobenzene
009 Hexachlorobenzene
010 1,2-dichloroethane
011 1,1,1-trichloroethane
012 Hexachloroethane
013 1,1-dichloroethane
014 1,1,2-trichloroethane
015 1,1,2,2-tetrachloroethane
016 Chloroethane
017 Bis (chloromethyl) ether
018 Bis (2-chloroethyl) ether
019 2-chloroethyl vinyl ether (mixed)
020 2-chloronaphthalene
021 2,4,6-trichlorophenol
022 Parachlorometa cresol
024 2-chlorophenol
025 1,2-dichlorobenzene
026 1,3-dichlorobenzene
027 1,4-dichlorobenzene
028 3,3-dichlorobenzidine
029 1,1-dichloroethylene
030 1,2-trans-dichloroethylene
031 2,4-dichlorophenol
032 1,2-dichloropropane
033 1,2-dischloropropylene (1,3-dichloropropene)
034 2,4-dimethylphenol
035 2,4-dinitrotoluene
036 2,6-dinitrotoluene
037 1,2-diphenylhydrazine
038 Ethylbenzene
039 Fluoranthene
040 4-chlorophenyl phenyl ether
041 4-bromophenyl phenyl ether
042 Bis(2-chloroisopropyl) ether
043 Bis(2-chloroethoxy) methane
045 Methyl chloride (dichloromethane)
046 Methyl bromide (bromomethane)
047 Bromoform (tribromomethane)
049 Trichlorofluoromethane
050 Dichlorodifluoromethane
051 Chlorodibromomethane
052 Hexachlorobutadiene
053 Hexachlorocyclopentadiene

054 Isophorone
055 Naphthalene
056 Nitrobenzene
057 2-nitrophenol
058 4-nitrophenol
059 2,4-dinitrophenol
060 4,6-dinitro-o-cresol
061 N-nitrosodimethylamine
062 N-nitrosodiphenylamine
063 N-nitrosodi-n-propylamine
064 Pentachlorophenol
065 Phenol
067 Butyl benzyl phthalate
068 Di-n-butyl phthalate
069 Di-n-octyl phthalate
070 Diethyl phthalate
071 Dimethyl phthalate
072 1,2-benzanthracene (benzo(a)anthracene)
073 Benzo(a)pyrene (3,4-benzopyrene)
074 3,4-Benzofluoranthene (benzo(b)fluoranthene)
075 11,12-benzofluoranthene (benzo(b)fluoranthene)
076 Chrysene
077 Acenaphthylene
078 Anthracene
079 1,12-benzoperylene (benzo(ghi)perylene)
080 Fluorene
081 Phenanthrene
082 1,2,5,6-dibenzanthracene dibenzo(,h)anthracene
083 Indeno(1,2,3-cd) pyrene (2,3-o-phenylene pyrene)
084 Pyrene
085 Tetrachloroethylene
088 Vinyl chloride (chloroethylene)
089 Aldrin
090 Dieldrin
091 Chlordane (technical mixture and metabolites)
092 4,4-DDT
093 4,4-DDE (p,p-DDX)
094 4,4-DDD (p,p-TDE)
095 Alpha-endosulfan
096 Beta-endosulfan
097 Endosulfan sulfate
098 Endrin
099 Endrin aldehyde
100 Heptachlor
101 Heptachlor epoxide (BHC-hexachlorocyclohexane)
102 Alpha-BHC
103 Beta-BHC
104 Gamma-BHC (lindane)
105 Delta-BHC (PCB-polychlorinated biphenyls)
106 PCB-1242 (Arochlor 1242)
107 PCB-1254 (Arochlor 1254)
108 PCB-1221 (Arochlor 1221)
109 PCB-1232 (Arochlor 1232)
110 PCB-1248 (Arochlor 1248)
111 PCB-1260 (Arochlor 1260)
112 PCB-1016 (Arochlor 1016)
113 Toxaphene
114 Antimony
115 Arsenic
125 Selenium
127 Thallium
129 2,3,7,8-tetrachloro-dibenzo-p-dioxin (TCDD)

(b) Subpart B—Calcium Subcategory

001 Acenaphthene
002 Acrolein
003 Acrylonitrile
004 Benzene
005 Benzidine
006 Carbon tetrachloride (tetrachloromethane)
007 Chlorobenzene
008 1,2,4-trichlorobenzene
009 Hexachlorobenzene
010 1,2-dichloroethane
011 1,1,1-trichloroethane
012 Hexachloroethane
013 1,1-dichloroethane
015 1,1,2,2-tetrachloroethane
016 Chloroethane
017 Bis (chloromethyl) ether
018 Bis (2-chloroethyl) ether
019 2-chloroethyl vinyl ether (mixed)
020 2-chloronaphthalene
021 2,4,6-trichlorophenol
022 Parachlorometa cresol
024 2-chlorophenol
025 1,2-dichlorobenzene
026 1,3-dichlorobenzene
027 1,4-dichlorobenzene
028 3,3-dichlorobenzidine
029 1,1-dichloroethylene
030 1,2-trans-dichloroethylene
031 2,4-dichlorophenol
032 1,2-dichloropropane
033 1,2-dichloropropylene (1,3-dichloropropene)
034 2,4-dimethylphenol
035 2,4-dinitrotoluene
036 2,6-dinitrotoluene
037 1,2-diphenylhydrazine
038 Ethylbenzene
039 Fluoranthene
040 4-chlorophenyl phenyl ether
041 4-bromophenyl phenyl ether
042 Bis(2-chloroisopropyl) ether
043 Bis(2-chloroethoxy) methane
045 Methyl chloride (dichloromethane)
046 Methyl bromide (bromomethane)
047 Bromoform (tribromomethane)
048 Dichlorobromomethane
049 Trichlorofluoromethane
050 Dichlorodifluoromethane
051 Chlorodibromomethane
052 Hexachlorobutadiene
053 Hexachlorocyclopentadiene
054 Isophorone
055 Naphthalene
056 Nitrobenzene
057 2-nitrophenol
058 4-nitrophenol
059 2,4-dinitrophenol
060 4,6-dinitro-o-cresol
061 N-nitrosodimethylamine
062 N-nitrosodiphenylamine
063 N-nitrosodi-n-propylamine
065 Phenol
067 Butyl benzyl phthalate
069 Di-n-octyl phthalate
070 Diethyl phthalate
071 Dimethyl phthalate
072 1,2-benzanthracene (benzo(a)anthracene)
073 Benzo(a)pyrene (3,4-benzopyrene)
074 3,4-Benzofluoranthene (benzo(b)fluoranthene)
075 11,12-benzofluoranthene (benzo(b)fluoranthene)
076 Chrysene
077 Acenaphthylene
078 Anthracene
079 1,12-benzoperylene (benzo(ghi)perylene)
080 Fluorene
081 Phenanthrene
082 1,2,5,6-dibenzanthracene dibenzo(,h)anthracene
083 Ideno (1,2,3-cd) pyrene (2,3-o-pheynylene pyrene)
084 Pyrene
085 Tetrachloroethylene
087 Trichloroethylene
088 Vinyl chloride (chloroethylene)
089 Aldrin
090 Dieldrin
091 Chlordane (technical mixture and metabolites)
092 4,4-DDT
093 4,4-DDE (p,p-DDX)
094 4,4-DDD (p,p-TDE)
095 Alpha-endosulfan
096 Beta-endosulfan
097 Endosulfan sulfate
098 Endrin
099 Endrin aldehyde
100 Heptachlor
101 Heptachlor epoxide (BHC-hexachlorocyclohexane)
102 Alpha-BHC
103 Beta-BHC
104 Gamma-BHC (lindane)
105 Delta-BHC (PCB-polychlorinated biphenyls)
106 PCB-1242 (Arochlor 1242)
107 PCB-1254 (Arochlor 1254)
108 PCB-1221 (Arochlor 1221)
109 PCB-1232 (Arochlor 1232)
110 PCB-1248 (Arochlor 1248)
111 PCB-1260 (Arochlor 1260)
112 PCB-1016 (Arochlor 1016)
113 Toxaphene
121 Cyanide, Total
129 2,3,7,8-tetrachloro-dibenzo-p-dioxin (TCDD)

(c) Subpart C—Lead Subcategory

002 Acrolein
003 Acrylonitrile
005 Benzidine
006 Carbon tetrachloride (tetrachloromethane)
007 Chlorobenzene
008 1,2,4-trichlorobenzene
009 Hexachlorobenzene
010 1,2-dichloroethane
012 Hexachloroethane
013 1,1-dichloroethane
014 1,1,2-trichloroethane
015 1,1,2,2-tetrachloroethane
016 Chloroethane
017 Bis(2-chloromethyl) ehter
018 Bis(2.chloroethyl) ether
019 2-chloroethyl vinyl ether (mixed)
020 2-chloronaphthalene
022 Parachlorometa cresol
025 1,2-dichlorobenzene
027 1,4-dichlorobenzene
028 3,3-dichlorobenzidine
029 1,1-dichloroethylene
030 1,2,-trans-dichloroethylene
032 1,2-dichloropropane
033 1,2-dichloropropylene (1,3,-dichloropropene)
034 2,4-dimethylphenol
035 2,4-dinitrotoluene
036 2,6-dinitrotoluene
037 1,2-diphenylhydrazine
040 4-chlorophenyl phenyl ether
041 4-bromophenyl phenyl ether

042 Bis(2-chloroisopropyl) ether
043 Bis(2-chloroethoxy) methane
045 Methyl chloride (dichloromethane)
046 Methyl bromide (bromomethane)
047 Bromoform (tribromomethane)
049 Trichlorofluoromethane
050 Dichlorodifluoromethane
052 Hexachlorobutadeine
053 Hexachlorocyclopentadiene
054 Isophorone
056 Nitrobenzene
057 2-nitrophenol
058 4-nitrophenol
059 2,4-dinitrophenol
060 4,6-dinitro-o-cresol
061 N-nitrosodimethylamine
062 N-nitrosodiphenylamine
063 N-nitrosodi-n-propylamine
064 Pentachlorophenol
070 Diethyl phthalate
071 Dimethyl phthalate
077 Acenaphthylene
079 1,12-benzoperylene (benzo(ghi)perylene)
082 1,2,5,6-dibenzanthracene dibenzo(,h)anthracene
083 Indeno(1,2,3-cd) pyrene (2,3-o-phenylene pyrene)
085 Tetrachloroethylene
088 Vinyl chloride (chloroethylene)
089 Aldrin
090 Dieldrin
091 Chlordane (technical mixture and metabolites)
092 4,4-DDT
093 4,4-DDE (p,p-DDX)
094 4,4-DDD (p,p-TDE)
095 Alpha-endosulfan
096 Beta-endosulfan
097 Endosulfan sulfate
098 Endrin
099 Endrin aldehyde
100 Heptachlor
102 Alpha-BHC
103 Beta-BHC
104 Gamma-BHC (lindane)
105 Delta-BHC (PCB-polychlorinated biphenyls)
106 PCB-1242 (Arochlor 1242)
107 PCB-1254 (Arochlor 1254)
108 PCB-1221 (Arochlor 1221)
109 PCB-1232 (Arochlor 1232)
110 PCB-1248 (Arochlor 1248)
111 PCB-1260 (Arochlor 1260)
112 PCB-1016 (Arochlor 1016)
113 Toxaphene
116 Asbestos
125 Selenium
127 Thallium
129 2,3,7,8-tetrachloro-dibenzo-p-dioxin (TCDD)

(d) Subpart D—Leclanche Subcategory

001 Acenaphthene
002 Acrolein
003 Acrylonitrile
004 Benzene
005 Benzidine
006 Carbon tetrachloride (tetrachloromethane)
007 Chlorobenzene
008 1,2,4-trichlorobenzene
009 Hexachlorobenzene
010 1,2-dichloroethane
012 Hexachloroethane
013 1,1-dichloroethane
014 1,1,2-trichloroethane
016 Chloroethane
017 Bis (chloromethyl) ether
018 Bis (2-chloroethyl) ether
019 2-chloroethyl vinyl ether (mixed)
020 2-chloronaphthalene
021 2,4,6-trichlorophenol
022 Parachlorometa cresol
024 2-chlorophenol
025 1,2-dichlorobenzene
026 1,3-dichlorobenzene
027 1,4-dichlorobenzene
028 3,3-dichlorobenzidine
029 1,1-dichloroethylene
030 1,2-trans-dichloroethylene
031 2,4-dichlorophenol
032 1,2-dichloropropane
033 1,2-dichloropropylene (1,3-dichloropropene)
034 2,4-dimethylphenol
035 2,4-dinitrotoluene
036 2,6-dinitrotoluene
037 1,2-diphenylhydrazine
038 Ethylbenzene
039 Fluoranthene
040 4-chlorophenyl phenyl ether
041 4-bromophenyl phenyl ether
042 Bis(2-chloroisopropyl) ether
043 Bis(2-chloroethoxy) methane
045 Methyl chloride (dichloromethane)
046 Methyl bromide (bromomethane)
047 Bromoform (tribromomethane)
049 Trichlorofluoromethane
050 Dichlorodifluoromethane
052 Hexachlorobutadiene
053 Hexachlorocyclopentadiene
054 Isophorone
055 Naphthalene
056 Nitrobenzene
057 2-nitrophenol
058 4-nitrophenol
059 2,4-dinitrophenol
060 4,6-dinitro-o-cresol
061 N-nitrosodimethylamine
062 N-nitrosodiphenylamine
063 N-nitrosodi-n-propylamine
064 Pentachlorophenol
068 Di-n-butyl phthalate
072 1,2-benzanthracene (benzo(a)anthracene)
073 Benzo(a)pyrene (3,4-benzopyrene)
074 3,4-Benzofluoranthene (benzo(b)fluoranthene)
075 11,12-benzofluoranthene (benzo(b)fluoranthene)
076 Chrysene
077 Acenaphthylene
078 Anthracene
079 1,12-benzoperylene (benzo(ghi)perylene)
080 Fluorene
081 Phenanthrene
082 1,2,5,6-dibenzanthracene dibenzo(,h)anthracene
083 Indeno(1,2,3-cd) pyrene (2,3-o-phenylene pyrene)
084 Pyrene
085 Tetrachloroethylene
087 Trichloroethylene
088 Vinyl chloride (chloroethylene)
089 Aldrin
090 Dieldrin
091 Chlordane (technical mixture and metabolites)
092 4,4-DDT
093 4,4-DDE (p,p-DDX)
094 4,4-DDD (p,p-TDE)
095 Alpha-endosulfan
096 Beta-endosulfan
097 Endosulfan sulfate
098 Endrin
099 Endrin aldehyde
100 Heptachlor
101 Heptachlor epoxide (BHC-hexachlorocyclohexane)
102 Alpha-BHC
103 Beta-BHC
104 Gamma-BHC (lindane)
105 Delta-BHC (PCB-polychlorinated biphenyls)
106 PCB-1242 (Arochlor 1242)
107 PCB-1254 (Arochlor 1254)
108 PCB-1221 (Arochlor 1221)
109 PCB-1232 (Arochlor 1232)
110 PCB-1248 (Arochlor 1248)
111 PCB-1260 (Arochlor 1260)
112 PCB-1016 (Arochlor 1016)
113 Toxaphene
116 Asbestos
127 Thallium

(e) Subpart E—Lithium Subcategory

001 Acenaphthene
002 Acrolein
003 Acrylonitrile
004 Benzene
005 Benzidine
006 Carbon tetrachloride (tetrachloromethane)
007 Chlorobenzene
008 1,2,4-trichlorobenzene
009 Hexachlorobenzene
010 1,2-dichloroethane
012 Hexachloroethane
013 1,1-dichloroethane
015 1,1,2,2-tetrachloroethane
016 Chloroethane
017 Bis (chloromethyl) ether
018 Bis (2-chloroethyl) ether
019 2-chloroethyl vinyl ether (mixed)
020 2-chloronaphthalene
021 2,4,6-trichlorophenol
022 Parachlorometacresol
024 2-chlorophenol
025 1,2-dichlorobenzene
026 1,3-dichlorobenzene
027 1,4-dichlorobenzene
028 3,3-dichlorobenzidine
029 1,1-dichloroethylene
030 1,2-trans-dichloroethylene
031 2,4-dichlorophenol
032 1,2-dichloropropane
033 1,2-dichloropropylene (1,3-dichloropropene)
034 2,4-dimethylphenol
035 2,4-dinitrotoluene
036 2,6-dinitrotoluene
037 1,2-diphenylhydrazine
038 Ethylbenzene
039 Fluoranthene
040 4-chlorophenyl phenyl ether
041 4-bromophenyl phenyl ether
042 Bis(2-chloroisopropyl) ether
043 Bis(2-chloroethoxyl) methane
045 Methyl chloride (dichloromethane)
046 Methyl bromide (bromomethane)
047 Bromoform (tribromomethane)
049 Trichlorofluoromethane
050 Dichlorodifluoromethane
051 Chlorodibromomethane
052 Hexachlorobutadiene
053 Hexachlorocyclopentadiene
054 Isophorone

055 Naphthalene
056 Nitrobenzene
057 2-nitrophenol
058 4-nitrophenol
059 2,4-dinitrophenol
060 4,6-dinitro-o-cresol
061 N-nitrosodimethylamine
062 N-nitrosodiphenylamine
063 N-nitrosodi-n-propylamine
065 Phenol
069 Di-n-octyl phthalate
070 Diethyl phthalate
071 Dimethyl phthalate
072 1,2-benzanthracene (benzo(a)anthracene)
073 Benzo(a)pyrene (3,4-benzopyrene)
074 3,4-Benzofluoranthene (benzo(b)fluoranthene)
075 11,12-benzofluoranthene (benzo(b)fluoranthene)
076 Chrysene
077 Acenaphthylene
078 Anthracene
079 1,12-benzoperylene (benzo(ghi)perylene)
080 Fluorene
081 Phenanthrene
082 1,2,5,6-dibenzanthracene dibenzo(,h)anthracene
083 Ideno(1,2,3-cd) pyrene (2,3-o-pheynylene pyrene)
084 Pyrene
085 Tetrachloroethylene
087 Trichloroethylene
088 Vinyl chloride (chloroethylene)
089 Aldrin
090 Dieldrin
091 Chlordane (technical mixture and metabolites)
092 4,4-DDT
093 4,4-DDE (p,p-DDX)
094 4,4-DDD (p,p-TDE)
095 Alpha-endosulfan
096 Beta-endosulfan
097 Endosulfan sulfate
098 Endrin
099 Endrin aldehyde
100 Heptachlor
101 Heptachlor epoxide (BHC-hexachlorocyclohexane)
102 Alpha-BHC
103 Beta-BHC
104 Gamma-BHC (lindane)
105 Delta-BHC (PCB-polychlorinated biphenyls)
106 PCB-1242 (Arochlor 1242)
107 PCB-1254 (Arochlor 1254)
108 PCB-1221 (Arochlor 1221)
109 PCB-1232 (Arochlor 1232)
110 PCB-1248 (Arochlor 1248)
111 PCB-1260 (Arochlor 1260)
112 PCB-1016 (Arochlor 1016)
113 Toxaphene
129 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD)

(f) Subpart F—Magnesium Subcategory

001 Acenaphthene
002 Acrolein
003 Acrylonitrile
004 Benzene
005 Benzidine
006 Carbon tetrachloride (tetrachloromethane)
007 Chlorobenzene
008 1,2,4-trichlorobenzene
009 Hexachlorobenzene
010 1,2-dichloroethane
011 1,1,1-trichloroethane
012 Hexachloroethane
013 1,1-dichloroethane
015 1,1,2,2-tetrachloroethane
016 Chloroethane
017 Bis(chloromethyl) ether
018 Bis(2-chloroethyl) ether
019 2-chloroethyl vinyl ether (mixed)
020 2-chloronaphthalene
021 2,4,6-trichlorophenol
022 Parachlorometa cresol
024 2-chlorophenol
025 1,2-dichlorobenzene
026 1,3-dichlorobenzene
027 1,4-dichlorobenzene
028 3,3-dichlorobenzidine
029 1,1-dichloroethylene
030 1,2-trans-dichloroethylene
031 2,4-dichlorophenol
032 1,2-dichloropropane
033 1,2-dichloropropylene (1,3-dichloropropene)
034 2,4-dimethylphenol
035 2,4-dinitrotoluene
036 2,6-dinitrotoluene
037 1,2-diphenylhydrazine
038 Ethylbenzene
039 Fluoranthene
040 4-chlorophenyl phenyl ether
041 4-bromophenyl phenyl ether
042 Bis(2-chloroisopropyl) ether
043 Bis(2-chloroethoxy) methane
045 Methyl chloride (dichloromethane)
046 Methyl bromide (bromomethane)
047 Bromoform (tribromomethane)
049 Trichlorofluoromethane
050 Dichlorodifluoromethane
051 Chlorodibromomethane
052 Hexachlorobutadiene
053 Hexachlorocyclopentadiene
054 Isophorone
055 Naphthalene
056 Nitrobenzene
057 2-nitrophenol
058 4-nitrophenol
059 2,4-dinitrophenol
060 4,6-dinitro-o-cresol
061 N-nitrosodimethylamine
062 N-nitrosodiphenylamine
063 N-nitrosodi-n-propylamine
065 Phenol
067 Butyl benzyl phthalate
070 Diethyl phthalate
071 Dimethyl phthalate
072 1,2-benzanthracene (benzo(a)anthracene)
073 Benzo(a)pyrene (3,4-benzopyrene)
074 3,4-Benzofluoranthene (benzo(b)fluoranthene)
075 11,12-benzofluoranthene (benzo(b)fluoranthene)
076 Chrysene
077 Acenaphthylene
078 Anthracene
079 1,12-benzoperylene (benzo(ghi)perylene)
080 Fluorene
081 Phenanthrene
082 1,2,5,6-dibenzanthracene dibenzo(,h) anthracene
083 Ideno(1,2,3-cd)pyrene (2,3-o-phenylene pyrene)
084 Pyrene
085 Tetrachloroethylene
088 Vinyl chloride (chloroethylene)
089 Aldrin
090 Dieldrin
091 Chlordane (technical mixture and metabolites)
092 4,4-DDT
093 4,4-DDE (p,p-DDX)
094 4,4-DDD (p,p-TDE)
095 Alpha-endosulfan
096 Beta-endosulfan
097 Endosulfan sulfate
098 Endrin
099 Endrin aldehyde
100 Heptachlor
101 Heptachlor epoxide (BHC-hexachlorocyclohexane)
102 Alpha-BHC
103 Beta-BHC
104 Gamma-BHC (lindane)
105 Delta-BHC (PCB-polychlorinated biphenyls)
106 PCB-1242 (Arochlor 1242)
107 PCB-1254 (Arochlor 1254)
108 PCB-1221 (Arochlor 1221)
109 PCB-1232 (Arochlor 1232)
110 PCB-1248 (Arochlor 1248)
111 PCB-1260 (Arochlor 1260)
112 PCB-1016 (Arochlor 1016)
113 Toxaphene
121 Cyanide, Total
129 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD)

(g) Subpart G—Zinc Subcategory

001 Acenaphthene
002 Acrolein
003 Acrylonitrile
005 Benzidine
006 Carbon tetrachloride (tetrachloromethane)
007 Chlorobenzene
008 1,2,4-trichlorobenzene
009 Hexachlorobenzene
010 1,2-dichloroethane
012 Hexachloroethane
015 1,1,2,2-tetrachloroethane
016 Chloroethane
017 Bis (chloromethyl) ether
018 Bis (2-chloroethyl) ether
019 2-chloroethyl vinyl ether (mixed)
020 2-chloronaphthalene
022 Parachlorometa cresol
025 1,2-dichlorobenzene
026 1,3-dichlorobenzene
027 1,4-dichlorobenzene
028 3,3-dichlorobenzidine
031 2,4-dichlorphenol
032 1,2-dichloropropane
033 1,2-dichloropropylene (1,3-dichloropropene)
034 2,4-dimethylphenol
035 2,4-dinitrotoluene
036 2,6-dinitrotoluene
037 1,2-diphenylhydrazine
039 Fluoranthene
040 4-chlorophenyl phenyl ether
041 4-bromophenyl phenyl ether
042 Bis(2-chloroisopropyl) ether
043 Bis(2-chloroethoxy) methane
045 Methyl chloride (dichloromethane)
046 Methyl bromide (bromomethane)
047 Bromoform (tribromomethane)
049 Trichlorofluoromethane
050 Dichlorodifluoromethane
052 Hexachlorobutadiene
053 Hewachlorocyclopentadiene
054 Isophorone

056 Nitrobenzene
057 2-nitrophenol
058 4-nitrophenol
059 2,4-dinitrophenol
060 4,6-dinitro-o-cresol
061 N-nitrosodimethylamine
062 N-nitrosodiphenylamine
063 N-nitrosodi-n-propylamine
069 Di-n-octyl phthalate
071 Dimethyl phthalate
072 1,2-benzanthracene (benzo(a)anthracene)
073 Benzo(a)pyrene (3,4-benzopyrene)
074 3,4-Benzofluoranthene (benzo (b) fluoranthene)
075 11,12-benzofluoranthene (benzo(b)fluoranthene)
076 Chrysene
079 1,12-benzoperylene (benzo(ghi)perylene)
082 1,2,5,6-dibenzanthracene dibenzo(,h)anthracene
083 Indeno(1,2,3-cd) pyrene (2,3-o-phenylene pyrene)
088 Vinyl chloride (chloroethylene)
089 Aldrin
090 Dieldrin
091 Chlordane (technical mixture and metabolites)
092 4,4-DDT
093 4,4-DDE (p,p-DDX)
094 4,4-DDD (p,p-TDE)
095 Alpha-endosulfan
096 Beta-endosulfan
097 Endosulfan sulfate
098 Endrin
099 Endrin aldehyde
100 Heptachlor
101 Heptachlor epoxide (BHC-hexachlorocyclohexane)
102 Alpha-BHC
103 Beta-BHC
104 Gamma-BHC (lindane)
105 Delta-BHC (PCB-polychlorinated biphenyls)
106 PCB-1242 (Arochlor 1242)
107 PCB-1254 (Arochlor 1254)
108 PCB-1221 (Arochlor 1221)
109 PCB-1232 (Arochlor 1232)
110 PCB-1248 (Arochlor 1248)
111 PCB-1260 (Arochlor 1260)
112 PCB-1016 (Arochlor 1016)
113 Toxaphene
116 Asbestos
127 Thallium
129 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD)

Appendix D—Toxic Pollutants Detected Below the Nominal Quantification Limit

(a) Subpart A—Cadmium Subcategory

044 Methylene chloride (dichloromethane)
048 Dichlorobromo methane
066 Bis(2-ethylhexyl) phthalate
087 Trichloroethylene
117 Beryllium

(b) Subpart B—Calcium Subcategory

064 Pentachlorophenol
068 Di-n-butyl phthalate
086 Toluene
114 Antimony
115 Arsenic
117 Beryllium
123 Mercury
125 Selenium
127 Thallium

(c) Subpart C—Lead subcategory

001 Acenapthene
004 Benzene
021 2,4,6-trichlorophenol
024 2-chlorophenol
026 1,3-dichlorobenzene
031 2,4-dichlorophenol
038 Ethylbenzene
039 Fluoranthene
044 Methylene chloride (dichloromethane)
048 Dichlorobromethane
051 Chlorodibromomethane
065 Phenol
072 1,2-benzanthracene (benzo(a)anthracene)
073 Benzo(a)pyrene (3,4-benzopyrene)
074 3,4-Benzofluoranthene (benzo(b)fluoranthene)
075 11,12-benzofluoranthene (benzo(b)fluoranthene)
076 Chrysene
080 Fluorene
084 Pyrene
087 Trichloroethylene
101 Heptachlor epoxide (BHC-hexachlorocyclohexane)
117 Beryllium
121 Cyanide, Total

(d) Subpart D—Leclanche Subcategory

011 1,1,1-trichloroethane
015 1,1,2,2-tetrachloroethane
044 Methylene chloride (dichloromethane)
048 Dichlorobromomethane
051 Chlorodibromomethane
065 Phenol
067 Butyl benzyl phthalate
068 Di-n-butyl phthalate
069 Di-n-octyl phthalate
071 Dimethyl phthalate
086 Toluene
117 Beryllium
126 Silver

(e) subpart E—Lithium Subcategory

011 1,1,1-trichloroethane
064 Pentachlorophenol
067 Butyl benzyl-phthalate
068 Di-n-butyl phthalate
086 Toluene
114 Antimony
115 Arsenic
117 Beryllium
123 Mercury
125 Selenium
127 Thallium

(f) Subpart F—Magnesium Subcategory

064 Pentachlorophenol
068 Di-n-butyl phthalate
086 Toluene
087 Trichloroethylene
114 Antimony
115 Arsenic
117 Beryllium
125 Selenium
127 Thallium

(g) Subpart G—Zinc Subcategory

004 Benzene
014 1,1,2-trichloroethane
021 2,4,6-trichlorophenol
024 2-chlorophenol
029 1,1-cichloroethylene
030 1,2-trans-dichloroethylene
038 Ethylbenzene
067 Butyl benzyl phthalate
068 Di-n-butyl phthalate
070 Diethyl phthalate
077 Acenaphthylene
078 Anthracene
080 Fluorene
081 Phenanthrene
084 Pyrene
085 Tetrachloroethylene
086 Toluene
087 Trichloroethylene
114 Antimony
117 Beryllium

Appendix E—Toxic Pollutants Detected From a Small Number of Sources

(a) Subpart A—Cadmium Subcategory

023 Chloroform (Trichloromethane)
086 Toluene
116 Asbestos
120 Copper

(b) Subpart B—Calcium Subcategory

066 Bis(2-ethylhexyl) phthalate

(c) Subpart C—Lead Subcategory

066 Bis(2-ethylhexyl) phthalate
067 Butyl benzylphthalate
068 Di-n-butyl phthalate
069 Di-n-octyl phthalate
078 Anthracene
081 Phenanthrene
086 Toluene

(d) Subpart D—Leclanche Subcategory

023 Chloroform (trichloromethane)
114 Antimony
121 Cyanide, Total

(e) Subpart E—Lithium Subcategory

066 Bis(2-ethylhexyl) phthalate

(f) Subpart F—Magnesium Subcategory

023 Chloroform (trichloromethane)
066 Bis(2-ethylhexyl) phthalate
069 Di-n-octyl phthalate

(g) Subpart G—Zinc Subcategory

023 Chloroform (trichloromethane)
064 Pentachlorophenol
065 Phenol
066 Bis(2-ethylhexyl) phthalate

Appendix F—Toxic Pollutants Detected in Small Amounts

(a) Subpart A—Cadmium Subcategory

None

(b) Subpart B—Calcium Subcategory

014 1,1, 2-trichloromethane
023 Chloroform (trichloromethane)
044 Methylene chloride (dichloromethane)
118 Cadmium
120 Copper
122 Lead
124 Nickel
126 Silver
128 Zinc

(c) Subpart C—Lead Subcategory

011 1,1, 1-trichloroethane
115 Arsenic
023 Chloroform (trichloromethane)
055 Naphthalene

(d) Subpart D—Leclanche Subcategory

070 Diethyl phthalate

(e) Subpart E—Lithium Subcategory

014 1,1, 2-trichloroethane
023 Chloroform (trichloromethane)
044 Methylene chloride (dichloromethane)
118 Cadmium
120 Copper
121 Cyanide, Total
124 Nickel
126 Silver

(f) Subpart F—Magnesium Subcategory

014 1,1, 2-trichloroethane
044 Methylene chloride (dichloromethane)
048 Dichlorobromomethane
118 Cadmium
120 Copper
123 Mercury
124 Nickel
128 Zinc

(g) Subpart G—Zinc Subcategory

011 1,1, 1-trichloroethane
013 1, 1-dichloroethane
044 Methylene chloride (dichloromethane)
055 Naphthalene

Appendix G—Toxic Pollutants Controlled But Not Specifically Regulated

(a) Subpart A—Cadmium Subcategory

119 Chromium
121 Cyanide
122 Lead
123 Mercury

(b) Subpart B—Calcium Subcategory

None

(c) Subpart C—Lead Subcategory

114 Antimony
118 Cadmium
119 Chromium
123 Mercury
124 Nickel
125 Silver
128 Zinc

(d) Subpart D—Leclanche Subcategory

115 Arsenic
118 Cadmium
119 Chromium
120 Copper
122 Lead
124 Nickel
125 Selenium

(e) Subpart E—Lithium Subcategory

116 Asbestos
128 Zinc

(f) Subpart F—Magnesium Subcategory

116 Asbestos

(g) Subpart G—Zinc Subcategory

115 Arsenic
118 Cadmium
120 Copper
122 Lead
125 Selenium

Appendix H—Subcategories Not Regulated

(a) Subcategories Not Regulated at BPT

Calcium
Leclanche
Lithium
Magnesium
Nuclear

(b) Subcategories Not Regulated at BAT

Calcium
Leclanche
Lithium
Magnesium
Nuclear

(c) Subcategories Not Regulated at PSES

Calcium
Lithium
Nuclear

(d) Subcategories Not Regulated at NSPS or PSNS

Nuclear

A new part 461 is added to 40 CFR Chapter I to read as follows:

PART 461—BATTERY MANUFACTURING POINT SOURCE CATEGORY

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 1972, 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), and 1361; 86 Stat. 816, Pub. L. 92–500; 91 Stat. 1567, Pub. L. 95–217.

General Provisions

§ 461.1 Applicability.

This part applies to any battery manufacturing plant that discharges or may discharge a pollutant to waters of the United States or that introduces pollutants to a publicly owned treatment works. Battery manufacturing operations subject to regulation under this part shall not be subject to regulation under Part 413 or 433.

§ 461.2 General definitions.

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

(a) "Battery" means a modular electric power source where part or all of the fuel is contained within the unit and electric power is generated directly from a chemical reaction rather than indirectly through a heat cycle engine. In this regulation there is no differentiation between a single cell and a battery.

(b) "Battery manufacturing operations" means all of the specific processes used to produce a battery including the manufacture of anodes and cathodes and associated ancillary operations. These manufacturing operations are excluded from regulation under any other point source category.

(c) "Ancillary operations" means all of the operations specific to battery manufacturing and not included specifically within anode or cathode manufacture (ancillary operations are primarily associated with battery assembly and chemical production of anode or cathode active materials).

(d) "Plate soak" shall mean the process operation of soaking or reacting lead subcategory battery plates, that are more than 2.5 mm (0.100 in) thick, in sulfuric acid.

(e) "Discharge allowance" means the amount of pollutant (mg per kg of production unit) that a plant will be permitted to discharge. For this category the allowances are specific to battery manufacturing operations.

(f) "Miscellaneous wastewater streams" shall mean the combined wastewater streams from the process operations listed below for each subcategory. If a plant has one of these streams then the plant receives the entire miscellaneous waste stream allowance.

(1) Cadmium Subcategory—cell wash, electrolyte preparation, floor and equipment wash, and employee wash.

(2) Lead Subcategory—floor wash, wet air pollution control, battery repair, laboratory, hand wash, and respirator wash.

(3) Lithium Subcategory—floor and equipment wash, cell testing, and lithium scrap disposal.

(4) Zinc Subcategory—cell wash, electrolyte preparation, employee wash, reject cell handling, floor and equipment wash.

(g) "Trucked batteries" shall mean batteries moved into or out of the plant by truck when the truck is actually washed in the plant to remove residues left in the truck from the batteries.

§ 461.3 Monitoring and reporting requirements

The "monthly average" regulatory values shall be the basis for the monthly average discharge in direct discharge permits and for pretreatment standards. Compliance with the monthly discharge limit is required regardless of the number of samples analyzed and averaged.

§ 461.4 Compliance date for PSES.

The compliance date for pretreatment standards for existing sources is March 9, 1987.

Subpart A—Cadmium Subcategory

§ 461.10 Applicability; description of the cadmium subcategory.

This subpart applies to discharges to waters of the United States, and introductions of pollutants into publicly owned treatment works from the manufacturing of cadmium anode batteries.

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

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

(1) Subpart A—Pasted and Pressed Powder Anodes.

BPT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of cadmium	
	English units—pounds per 1,000,000 pounds of cadmium	
Cadmium	0.92	0.41
Nickel	5.18	3.43
Zinc	3.94	1.65
Cobalt	0.57	0.24
Oil and grease	54.00	32.40

BPT EFFLUENT LIMITATIONS—Continued

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
TSS	111.00	52.65
pH	(1)	(1)

[1] Within the range of 7.5 to 10.0 at all times.

(2) Subpart A—Electrodeposited Anodes.

BPT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of cadmium	
	English units—pounds per 1,000,000 pounds of cadmium	
Cadmium	237.0	104.6
Nickel	1,333.2	835.2
Zinc	1,017.6	425.2
Cobalt	148.4	62.7
Oil and grease	13,940.0	8,364.0
TSS	23,577.0	13,592.0
pH	(1)	(1)

[1] Within the range of 7.5 to 10.0 at all times.

(3) Subpart A—Impregnated Anodes.

BPT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of cadmium	
	English units—pounds per 1,000,000 pounds of cadmium.	
Cadmium	333.3	149.7
Nickel	1,916.2	1,267.5
Zinc	1,457.1	608.8
Cobalt	209.6	89.8
Oil and grease	19,960.0	11,976.0
TSS	40,918.0	19,461.0
pH	(1)	(1)

[1] Within the range of 7.5 to 10.0 at all times.

(4) Subpart A—Nickel Electrodeposited Cathodes.

BPT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of nickel applied	
	English units—pounds per 1,000,000 pounds of nickel applied	
Cadmium	193.5	85.4
Nickel	1,092.5	722.6
Zinc	830.7	347.1
Cobalt	119.5	51.2
Oil and grease	11,330.0	6,828.0
TSS	23,329.0	11,095.5
pH	(1)	(1)

[1] Within the range of 7.5 to 10.0 at all times.

(5) Subpart A—Nickel Impregnated Cathodes.

BPT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of nickel applied	
	English units—pounds per 1,000,000 pounds of nickel applied	
Cadmium	557.6	246.0
Nickel	3,148.8	2,082.8
Zinc	2,394.4	1,000.4
Cobalt	344.4	147.6
Oil and grease	32,800.0	19,680.0
TSS	67,240.0	31,980.0
pH	(1)	(1)

[1] Within the range of 7.5 to 10.0 at all times.

(6) Subpart A—Miscellaneous Wastewater Streams.

BPT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of cells produced	
	English units—pounds per 1,000,000 pounds of cells produced	
Cadmium	6.29	2.77
Nickel	35.54	23.50
Zinc	27.02	11.29
Cobalt	3.89	1.66
Oil and grease	370.20	222.12
TSS	758.91	360.94
pH	(1)	(1)

[1] Within the range of 7.5 to 10.0 at all times.

(7) Subpart A—Cadmium Powder Production.

BPT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of cadmium powder produced	
	English units—pounds per 1,000,000 pounds of cadmium powder produced	
Cadmium	22.34	9.86
Nickel	126.14	83.44
Zinc	95.92	40.08
Cobalt	13.80	5.91
Oil and grease	1,314.00	788.40
TSS	2,693.00	1,281.20
pH	(1)	(1)

[1] Within the range of 7.5 to 10.0 at all times.

(8) Subpart A—Silver Powder Production.

BPT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of silver powder produced	
	English units—pounds per 1,000,000 pounds of silver powder produced	
Cadmium	7.21	3.18

BPT EFFLUENT LIMITATIONS—Continued

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
Nickel	40.70	26.92
Silver	8.69	3.61
Zinc	30.95	12.93
Cobalt	4.45	1.91
Oil and grease	424.00	254.40
TSS	869.20	413.40
pH	(1)	(1)

[1] Within the range of 7.5 to 10.0 at all times.

(9) Subpart A—Cadmium Hydroxide Production.

BPT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of cadmium used	
	English units—pounds per 1,000,000 pounds of cadmium used	
Cadmium	0.31	0.14
Nickel	1.73	1.14
Zinc	1.31	0.55
Cobalt	0.19	0.08
Oil and grease	18.00	10.80
TSS	36.90	17.60
pH	(1)	(1)

[1] Within the range of 7.5 to 10.0 at all times.

(10) Subpart A—Nickel Hydroxide Production.

BPT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of nickel used	
	English units—pounds per 1,000,000 pounds of nickel used	
Cadmium	37.4	16.5
Nickel	211.2	139.7
Zinc	160.6	67.1
Cobalt	23.1	9.9
Oil and grease	2,200.0	1,320.0
TSS	4,510.0	2,145.0
pH	(1)	(1)

[1] Within the range of 7.5 to 10.0 at all times.

(b) There shall be no discharge allowance for process wastewater pollutants from any battery manufacturing operation other than those battery manufacturing operations listed above.

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

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

(1) Subpart A—Electrodeposited Anodes.

BAT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of cadmium	
	English units—pounds per 1,000,000 pounds of cadmium	
Cadmium	11.95	5.27
Nickel	67.49	44.64
Zinc	51.32	21.44
Cobalt	7.38	3.16

(2) Subpart A—Impregnated Anodes.

BAT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of cadmium	
	English units—pounds per 1,000,000 pounds of cadmium	
Cadmium	68.0	30.0
Nickel	384.0	254.0
Zinc	292.0	122.0
Cobalt	42.0	18.0

(3) Subpart A—Nickel Electrodeposited Cathodes.

BAT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of nickel applied	
	English units—pounds per 1,000,000 lb of nickel applied	
Cadmium	11.22	4.95
Nickel	63.36	41.91
Zinc	48.18	20.13
Cobalt	6.93	2.97

(4) Subpart A—Nickel Impregnated Cathodes.

BAT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of nickel applied	
	English units—pounds per 1,000,000 lb of nickel applied	
Cadmium	68.0	30.0
Nickel	384.0	254.0
Zinc	292.0	122.0
Cobalt	42.0	18.0

(5) Subpart A—Miscellaneous Wastewater Streams.

BAT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of cells produced	
	English units—pounds per 1,000,000 lb of cells produced	
Cadmium	0.79	0.35
Nickel	4.47	2.96
Zinc	3.40	1.42
Cobalt	0.49	0.21

(6) Subpart A—Cadmium Powder Production.

BAT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of cadmium powder produced	
	English units—pounds per 1,000,000 lb of cadmium powder produced	
Cadmium	2.23	0.99
Nickel	12.61	8.34
Zinc	9.59	4.01
Cobalt	1.38	0.59

(7) Subpart A—Silver Powder Production.

BAT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of silver powder produced	
	English units—pounds per 1,000,000 lb of silver powder produced	
Cadmium	1.09	0.48
Nickel	6.16	4.08
Silver	1.32	0.55
Zinc	4.69	1.96
Cobalt	0.67	0.29

(8) Subpart A—Cadmium Hydroxide Production.

BAT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric Units—mg/kg of cadmium used	
	English Units—pounds per 1,000,000 pounds of cadmium used	
Cadmium	0.05	0.02
Nickel	0.27	0.18
Zinc	0.20	0.09
Cobalt	0.03	0.01

(9) Subpart A—Nickel Hydroxide Production.

BAT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric Units—mg/kg of nickel used	
	English Units—pounds per 1,000,000 pounds of nickel used	
Cadmium	5.61	2.43
Nickel	31.63	20.86
Zinc	24.03	10.07
Cobalt	3.47	1.43

(b) There shall be no discharge allowance for process wastewater pollutants from any battery manufacturing operation other than those battery manufacturing operations listed above.

§ 461.13 New source performance standards (NSPS).

(a) The discharge of wastewater pollutants from any new source subject to this subpart shall not exceed the standards set forth below:

(1) Subpart A—Electrodeposited Anodes—NSPS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric Units—mg/kg of cadmium	
	English Units—pounds per 1,000,000 pounds of cadmium	
Cadmium	7.03	2.81
Nickel	19.33	13.01
Zinc	35.85	14.76
Cobalt	4.92	2.46
Oil and Grease	351.5	351.5
TSS	527.3	421.8
pH	(1)	(1)

[1] Within the range of 7.5–10.0 at all times.

(2) Subpart A—Impregnated Anodes—NSPS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric Units—mg/kg of cadmium	
	English Units—pounds per 1,000,000 pounds of cadmium	
Cadmium	40.0	16.0
Nickel	110.0	74.0
Zinc	204.0	84.0
Cobalt	28.0	14.0
Oil and Grease	2,000.0	2,000.0
TSS	3,000.0	2,400.0
pH	(1)	(1)

[1] Within the range of 7.5–10.0 at all times.

(3) Subpart A—Nickel Electrodeposited Cathodes—NSPS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of nickel applied	
	English units—pounds per 1,000,000 pounds of nickel applied	
Cadmium	6.60	2.64
Nickel	18.15	12.21
Zinc	33.66	13.86
Cobalt	4.62	2.31
Oil and Grease	330.0	330.0
TSS	435.0	396.0
pH	(1)	(1)

[1] Within the range of 7.5–10.0 at all times.

(4) Subpart A—Nickel Impregnated Cathodes—NSPS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of nickel applied	
	English units—pounds per 1,000,000 pounds of nickel applied.	
Cadmium	40.0	16.0
Nickel	110.0	74.0
Zinc	204.0	84.0
Cobalt	28.0	14.0
Oil and Grease	2,000.0	2,000.0
TSS	3,000.0	2,400.0
pH	(1)	(1)

[1] Within the range of 7.5–10.0 at all times.

(5) Subpart A—Miscellaneous Wastewater Streams—NSPS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of cell produced	
	English units—pounds per 1,000,000 pounds of cells produced	
Cadmium	0.47	0.19
Nickel	1.28	0.86
Zinc	2.38	0.98
Cobalt	0.33	0.16
Oil and Grease	23.3	23.3
TSS	35.0	28.0
pH	(1)	(1)

[1] Within the range of 7.5–10.0 at all times.

(6) Subpart A—Cadmium Powder Production—NSPS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of cadmium powder produced	
	English units—pounds per 1,000,000 pounds of cadmium powder produced	
Cadmium	1.31	0.53
Nickel	3.61	2.43
Zinc	6.70	2.76
Cobalt	0.92	0.46
Oil and Grease	65.70	65.70
TSS	98.55	78.84
pH	(1)	(1)

[1] Within the range of 7.5–10.0 at all times.

(7) Subpart A—Silver Powder Production—NSPS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of silver powder produced	
	English units—pounds per 1,000,000 pounds of silver powder produced	
Cadmium	0.64	0.26
Nickel	1.77	1.19
Silver	0.93	0.39
Zinc	3.27	1.35
Cobalt	0.45	0.22
Oil and Grease	32.10	32.10
TSS	48.15	38.52
pH	(1)	(1)

[1] Within the range of 7.5-10.0 at all times.

(8) Subpart A—Cadmium Hydroxide Production—NSPS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of cadmium used	
	English units—pounds per 1,000,000 pounds of cadmium used	
Cadmium	0.028	0.011
Nickel	0.077	0.051
Zinc	0.142	0.058
Cobalt	0.019	0.009
Oil and Grease	1.40	1.40
TSS	2.10	1.68
pH	(1)	(1)

[1] Within the range of 7.5-10.0 at all times.

(9) Subpart A—Nickel Hydroxide Production—NSPS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of nickel used	
	English units—pounds per 1,000,000 pounds of nickel used	
Cadmium	3.30	1.32
Nickel	9.08	6.11
Zinc	16.83	6.93
Cobalt	2.31	1.16
Oil and grease	165.0	165.0
TSS	247.5	198.0
pH	(1)	(1)

[1] Within the range of 7.5-10.0 at all times.

(b) There shall be no discharge allowance for process wastewater pollutants from any battery manufacturing operation other than those battery manufacturing operations listed above.

§ 461.14 Pretreatment standards for existing sources. (PSES).

(a) Except as provided in 40 CFR 403.7 and § 403.13, any existing source subject to this subpart which introduces pollutants into a publicly owned treatment works must comply with 40 CFR Part 403 and achieve the pretreatment standards for existing sources listed below:

(1) Subpart A—Electrodeposited Anodes.

PSES

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of cadmium	
	English units—pounds per 1,000,000 pounds of cadmium	
Cadmium	11.95	5.27
Nickel	67.49	44.64
Zinc	51.32	21.44
Cobalt	7.38	3.16

(2) Subpart A—Impregnated Anodes.

PSES

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of cadmium	
	English units—pounds per 1,000,000 pounds of cadmium	
Cadmium	68.0	30.0
Nickel	384.0	254.0
Zinc	292.0	122.0
Cobalt	42.0	18.0

(3) Subpart A—Nickel Electrodeposited Cathodes.

PSES

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of nickel applied	
	English units—pounds per 1,000,000 pounds of nickel applied	
Cadmium	11.22	4.95
Nickel	63.36	41.91
Zinc	48.18	20.13
Cobalt	6.93	2.97

(4) Subpart A—Nickel Impregnated Cathodes—PSES.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of nickel applied	
	English Units—pounds per 1,000,000 lb of nickel applied	
Cadmium	68.0	30.0
Nickel	384.0	254.0
Zinc	292.0	122.0
Cobalt	42.0	18.0

(5) Subpart A—Miscellaneous Wastewater Streams—PSES.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of cells produced	
	English Units—pounds per 1,000,000 lb of cells produced	
Cadmium	0.79	0.35
Nickel	4.47	2.96
Zinc	3.40	1.42
Cobalt	0.49	0.21

(6) Subpart A—Cadmium Powder Production—PSES.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of cadmium powder produced	
	English Units—pounds per 1,000,000 lb of cadmium powder produced	
Cadmium	2.23	0.99
Nickel	12.61	8.34
Zinc	9.59	4.01
Cobalt	1.38	0.59

(7) Subpart A—Silver Powder Production—PSES.

pollutant or Pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric Units—mg/kg of silver powder produced	
	English Units—pounds per 1,000,000 lb of silver powder produced	
Cadmium	1.09	0.48
Nickel	6.16	4.08
Silver	1.32	0.55
Zinc	4.69	1.96
Cobalt	0.67	0.29

(8) Subpart A—Cadmium Hydroxide Production—PSES.

pollutant or Pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric Units—mg/kg of cadmium used	
	English Units—pounds per 1,000,000 lb of cadmium used	
Cadmium	0.05	0.02
Nickel	0.27	0.18
Zinc	0.20	0.09
Cobalt	0.03	0.012

(9) Subpart A—Nickel Hydroxide Production—PSES.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric Units—mg/kg of nickel used	
	English Units—pounds per 1,000,000 lb of nickel used	
Cadmium	5.61	2.48

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
Nickel	31.68	20.96
Zinc	24.09	10.07
Cobalt	3.47	1.49

(b) There shall be no discharge allowance for process wastewater pollutants from any battery manufacturing operation other than those battery manufacturing operations listed above.

§ 461.15 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 pretreatment standards for new sources listed below:

(1) Subpart A—Electrodeposited Anodes—PSNS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of cadmium	
	English units—pounds per 1,000,000 pounds of cadmium	
Cadmium	7.03	2.81
Nickel	19.33	13.01
Zinc	35.85	14.76
Cobalt	4.92	2.46

(2) Subpart A—Impregnated Anodes—PSNS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of cadmium	
	English units—pounds per 1,000,000 pounds of cadmium	
Cadmium	40.0	16.0
Nickel	110.0	74.0
Zinc	204.0	84.0
Cobalt	28.0	14.0

(3) Subpart A—Nickel Electrodeposited Cathodes—PSNS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of nickel applied	
	English units—pounds per 1,000,000 pounds of nickel applied	
Cadmium	6.60	2.64

—Continued

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
Nickel	18.15	12.21
Zinc	33.68	13.88
Cobalt	4.62	2.31

(4) Subpart A—Nickel Impregnated Cathodes—PSNS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of nickel applied	
	English units—pounds per 1,000,000 pounds of nickel applied	
Cadmium	40.0	16.0
Nickel	110.0	74.0
Zinc	204.0	84.0
Cobalt	28.0	14.0

(5) Subpart A—Miscellaneous Wastewater Streams—PSNS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of cells produced	
	English units—pounds per 1,000,000 pounds of cells produced	
Cadmium	0.47	0.19
Nickel	1.28	0.86
Zinc	2.38	0.98
Cobalt	0.33	0.16

(6) Subpart A—Cadmium Powder Production—PSNS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of cadmium powder produced	
	English units—pounds per 1,000,000 pounds of cadmium powder produced	
Cadmium	1.31	0.53
Nickel	3.61	2.43
Zinc	6.70	2.76
Cobalt	0.92	0.46

(7) Subpart A—Silver Powder Production—PSNS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of silver powder produced	
	English units—pounds per 1,000,000 pounds of silver powder produced	
Cadmium	0.64	0.26
Nickel	1.77	1.19
Silver	0.93	0.39

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average.
Zinc	3.27	1.35
Cobalt	0.45	0.22

(8) Subpart A—Cadmium Hydroxide Production—PSNS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of cadmium used	
	English units—pounds per 1,000,000 pounds of cadmium used	
Cadmium	0.028	0.011
Nickel	0.077	0.051
Zinc	0.142	0.058
Cobalt	0.019	0.009

(9) Subpart A—Nickel Hydroxide Production—PSNS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of nickel used	
	English units—pounds per 1,000,000 pounds of nickel used	
Cadmium	3.30	1.32
Nickel	9.08	6.11
Zinc	16.83	6.93
Cobalt	2.31	1.16

(b) There shall be no discharge allowance for process wastewater pollutants from any battery manufacturing operation other than those battery manufacturing operations listed above.

§ 461.16 [Reserved]

Subpart B—Calcium Subcategory

§ 461.20 Applicability; description of the calcium subcategory.

This subpart applies to discharges to waters of the United States and introductions of pollutants into publicly owned treatment works from manufacturing calcium anode batteries.

§§ 461.21–461.22 [Reserved]

§ 461.23 New source performance standards (NSPS).

(a) The discharge of wastewater pollutants from any new source subject to this subpart shall not exceed the standards set forth below:

(b) There shall be no discharge for process wastewater pollutants from any battery manufacturing operations.

§ 461.24 [Reserved]

§ 461.25 Pretreatment standards for new sources (PSNS).

(a) Except as provided in § 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 pretreatment standards for new sources listed below:

(b) There shall be no discharge for process wastewater pollutants from any battery manufacturing operations.

§ 461.26 [Reserved]

Subpart C—Lead Subcategory

§ 461.30 Applicability; description of the lead subcategory.

This subpart applies to discharges to waters of the United States and introduction of pollutants into publicly owned treatment works from the manufacturing of lead anode batteries.

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

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

(1) Subpart C—Closed Formation—Double Fill, or Fill and Dump.

BPT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of lead used	
	English units—pounds per 1,000,000 pounds of lead used	
Copper	0.86	0.45
Lead	0.19	0.090
Iron	0.54	0.27
Oil and grease	9.00	5.40
TSS	18.45	8.78
pH	(¹)	(¹)

¹ Within the range of 7.5 to 10.0 at all times.

(2) Subpart C—Open Formation—Dehydrated.

BPT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of lead used	
	English units—pounds per 1,000,000 pounds of lead used	
Copper	20.99	11.05
Lead	4.64	2.21
Iron	16.13	6.74
Oil and grease	221.00	132.60
TSS	453.05	215.47
pH	(¹)	(¹)

¹ Within the range of 7.5 to 10.0 at all times.

(3) Subpart C—Open Formation—Wet.

BPT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of lead used	
	English units—pounds per 1,000,000 pounds of lead used	
Copper	0.10	0.05
Lead	0.02	0.01
Iron	0.06	0.03
Oil and grease	1.06	0.64
TSS	2.17	1.03
pH	(¹)	(¹)

¹ Within the range of 7.5 to 10.0 at all times.

(4) Subpart C—Plate Soak.

BPT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of lead used	
	English units—pounds per 1,000,000 pounds of lead used	
Copper	0.040	0.020
Lead	0.009	0.004
Iron	0.030	0.010
Oil and grease	0.420	0.250
TSS	0.860	0.410
pH	(¹)	(¹)

¹ Within the range of 7.5 to 10.0 at all times.

(5) Subpart C—Battery Wash (with Detergent).

BPT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of lead used	
	English units—pounds per 1,000,000 pounds of lead used	
Copper	1.71	0.90
Lead	0.38	0.18
Iron	1.08	0.55
Oil and grease	18.00	10.80
TSS	36.90	17.55
pH	(¹)	(¹)

¹ Within the range of 7.5 to 10.0 at all times.

(6) Subpart C—Battery Wash (Water Only).

BPT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of lead used	
	English units—pounds per 1,000,000 pounds of lead used	
Copper	1.12	0.59
Lead	0.25	0.12
Iron	0.71	0.36
Oil and grease	11.80	7.08
TSS	24.19	11.51
pH	(¹)	(¹)

¹ Within the range of 7.5 to 10.0 at all times.

(7) Subpart C—Direct Chill Lead Casting.

BPT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of lead used	
	English units—pounds per 1,000,000 pounds of lead used	
Copper	0.00040	0.00020
Lead	0.00008	0.00004
Iron	0.00020	0.00010
Oil and grease	0.00400	0.00200
TSS	0.00800	0.00300
pH	(¹)	(¹)

¹ Within the range of 7.5 to 10.0 at all times.

(8) Subpart C—Mold Release Formulation.

BPT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of lead used	
	English units—pounds per 1,000,000 pounds of lead used	
Copper	0.011	0.006
Lead	0.002	0.001
Iron	0.007	0.004
Oil and grease	0.120	0.072
TSS	0.246	0.117
pH	(¹)	(¹)

¹ Within the range of 7.5 to 10.0 at all times.

(9) Subpart C—Truck Wash.

BPT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of lead in trucked batteries	
	English units—pounds per 1,000,000 pounds of lead in trucked batteries	
Copper	0.026	0.014
Lead	0.005	0.002
Iron	0.016	0.008
Oil and grease	0.280	0.160
TSS	0.574	0.273
pH	(¹)	(¹)

¹ Within the range of 7.5 to 10.0 at all times.

(10) Subpart C—Laundry.

BPT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of lead used English units—pounds per 1,000,000 pounds of lead used	
Copper	0.21	0.11
Lead	0.05	0.02
Iron	0.13	0.07
Oil and grease	2.18	1.31
TSS	4.47	2.13
pH	(1)	(1)

1 Within the range of 7.5 to 10.0 at all times.

(11) Subpart C—Miscellaneous Wastewater Streams.

BPT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of lead used English units—pounds per 1,000,000 pounds of lead used	
Copper	0.81	0.43
Lead	0.18	0.09
Iron	0.51	0.26
Oil and grease	8.54	5.12
TSS	17.51	8.33
pH	(1)	(1)

1 Within the range of 7.5 to 10.0 at all times.

(b) There shall be no discharge allowance for process wastewater pollutants from any battery manufacturing operation other than those battery manufacturing operations listed above.

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

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

(1) Subpart C—Open Formation—Dehydrated.

BAT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of lead used English units—pounds per 1,000,000 lb of lead used	
Copper	3.19	1.68
Lead	0.71	0.34
Iron	2.02	1.02

(2) Subpart C—Open Formation—Wet.

BAT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of lead used English units—pounds per 1,000,000 lb of lead used	
Copper	0.100	0.053
Lead	0.022	0.010
Iron	0.06	0.03

(3) Subpart C—Plate Soak.

BAT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of lead used English units—pounds per 1,000,000 lb of lead used	
Copper	0.033	0.021
Lead	0.008	0.004
Iron	0.030	0.010

(4) Subpart C—Battery Wash (Detergent).

BAT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of lead used English units—pounds per 1,000,000 lb of lead used	
Copper	0.89	0.45
Lead	0.19	0.09
Iron	0.54	0.27

(5) Subpart C—Direct Chill Lead Casting.

BAT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of lead used English units—pounds per 1,000,000 lb of lead used	
Copper	0.0004	0.0002
Lead	0.00008	0.00004
Iron	0.0002	0.0001

(6) Subpart C—Mold Release Formulation.

BAT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of lead used English units—pounds per 1,000,000 lb of lead used	
Copper	0.011	0.006
Lead	0.002	0.001
Iron	0.007	0.003

(7) Subpart C—Truck Wash.

BAT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of lead in trucked batteries English units—pounds per 1,000,000 lb of lead in trucked batteries	
Copper	0.026	0.014
Lead	0.005	0.002
Iron	0.016	0.008

(8) Subpart C—Laundry.

BAT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of lead used English units—pounds per 1,000,000 pounds of lead used	
Copper	0.21	0.11
Lead	0.05	0.02
Iron	0.13	0.07

(9) Subpart C—Miscellaneous Wastewater Streams.

BAT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of lead used English units—pounds per 1,000,000 pounds of lead used	
Copper	0.58	0.31
Lead	0.13	0.06
Iron	0.37	0.19

(b) There shall be no discharge allowance for process wastewater pollutants from any battery manufacturing operation other than those battery manufacturing operations listed above.

§ 461.33 New source performance standards (NSPS).

(a) The discharge of wastewater pollutants from any new source subject to this subpart shall not exceed the standards set forth below:

(1) Subpart C—Open Formation—Dehydrated—NSPS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of lead used	
	English units—pounds per 1,000,000 lb of lead used	
Copper	2.15	1.02
Lead	0.47	0.21
Iron	2.01	1.02
Oil and grease	16.80	16.80
TSS	25.20	20.16
pH	(1)	(1)

[1] Within the limits of 7.5 to 10.0 at all times.

(2) Subpart C—Open Formation—Wet—NSPS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of lead used	
	English units—pounds per 1,000,000 lb of lead used	
Copper	0.067	0.032
Lead	0.014	0.006
Iron	0.063	0.032
Oil and grease	0.53	0.53
TSS	0.80	0.64
pH	(1)	(1)

[1] Within the limits of 7.5 to 10.0 at all times.

(3) Subpart C—Plate Soak—NSPS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of lead used	
	English units—pounds per 1,000,000 pounds of lead used	
Copper	0.026	0.012
Lead	0.005	0.002
Iron	0.025	0.012
Oil and grease	0.21	0.21
TSS	0.32	0.25
pH	(1)	(1)

[1] Within the limits of 7.5 to 10.0 at all times.

(4) Subpart C—Battery Wash (Detergent)—NSPS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of lead used	
	English units—pounds per 1,000,000 pounds of lead used	
Copper	0.576	0.274
Lead	0.126	0.058
Iron	0.540	0.274
Oil and grease	4.50	4.50
TSS	6.75	5.40
pH	(1)	(1)

[1] Within the limits of 7.5 to 10.0 at all times.

(5) Subpart C—Direct Chill Lead Casting—NSPS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of lead used	
	English units—pounds per 1,000,000 pounds of lead used	
Copper	0.000256	0.000122
Lead	0.000056	0.000026
Iron	0.000240	0.000122
Oil and grease	0.0020	0.0020
TSS	0.0030	0.0024
pH	(1)	(1)

[1] Within the limits of 7.5 to 10.0 at all times.

(6) Subpart C—Mold Release Formulation—NSPS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of lead used	
	English units—pounds per 1,000,000 pounds of lead used	
Copper	0.0077	0.0037
Lead	0.0017	0.0008
Iron	0.0072	0.0037
Oil and grease	0.060	0.060
TSS	0.090	0.072
pH	(1)	(1)

[1] Within the limits of 7.5 to 10.0 at all times.

(7) Subpart C—Truck Wash—NSPS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of lead in trucked batteries	
	English units—pounds per 1,000,000 lb of lead in trucked batteries	
Copper	0.006	0.003
Lead	0.001	0.0007
Iron	0.006	0.003
Oil and grease	0.050	0.050
TSS	0.075	0.060
pH	(1)	(1)

[1] Within the limits of 7.5 to 10.0 at all times.

(8) Subpart C—Laundry—NSPS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of lead used	
	English units—pounds per 1,000,000 lb of lead used	
Copper	0.14	0.07
Lead	0.03	0.01
Iron	0.13	0.07
Oil and grease	1.09	1.09
TSS	1.64	1.31
pH	(1)	(1)

[1] Within the limits of 7.5 to 10.0 at all times.

(9) Subpart C—Miscellaneous Wastewater Streams—NSPS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of lead used	
	English units—pounds per 1,000,000 lb of lead used	
Copper	0.39	0.19
Lead	0.085	0.039
Iron	0.37	0.19
Oil and grease	3.07	3.07
TSS	4.61	3.69
pH	(1)	(1)

[1] Within the limits of 7.5 to 10.0 at all times.

(b) There shall be no discharge allowance for process wastewater pollutants from any battery manufacturing operation other than those battery manufacturing operations listed above.

§ 461.34 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 pretreatment standards for existing sources listed below:

(1) Subpart C—Open Formation—Dehydrated—PSES.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of lead used	
	English units—pounds per 1,000,000 lb of lead used	
Copper	3.19	1.68
Lead	0.71	0.34

(2) Subpart C—Open Formation—Wet—PSES.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of lead used	
	English units—pounds per 1,000,000 lb of lead used	
Copper	0.100	0.053
Lead	0.022	0.010

(3) Subpart C—Plate Soak—PSES.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of lead used	
	English units—pounds per 1,000,000 lb of lead used	
Copper	0.039	0.021
Lead	0.008	0.004

(4) Subpart C—Battery Wash—Detergent—PSES.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of lead used	
	English units—pounds per 1,000,000 lb of lead used	
Copper	0.86	0.45
Lead	0.19	0.09

(5) Subpart C—Direct Chill Lead Casting—PSES.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of lead used	
	English units—pounds per 1,000,000 lb of lead used	
Copper	0.0004	0.0002
Lead	0.00003	0.00004

(6) Subpart C—Mold Release Formulation—PSES.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of lead used	
	English units—pounds per 1,000,000 lb of lead used	
Copper	0.011	0.006
Lead	0.002	0.001

(7) Subpart C—Truck Wash—PSES.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of lead in trucked batteries	
	English units—pounds per 1,000,000 pounds of lead in trucked batteries	
Copper	0.026	0.014
Lead	0.005	0.002

(8) Subpart C—Laundry—PSES.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of lead used	
	English units—pounds per 1,000,000 pounds of lead used	
Copper	0.21	0.11
Lead	0.05	0.02

(9) Subpart C—Miscellaneous Wastewater Streams—PSES.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of lead used	
	English units—pounds per 1,000,000 pounds of lead used	
Copper	0.53	0.31
Lead	0.13	0.06

(b) There shall be no discharge allowance for process wastewater pollutants from any battery manufacturing operation other than those battery manufacturing operations listed above.

§ 461.35 Pretreatment standards for new sources (PSNS).

(a) Except as provided in § 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:

(1) Subpart C—Open Formation—Dehydrated—PSNS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of lead used	
	English units—pounds per 1,000,000 pounds of lead used	
Copper	2.15	1.02
Lead	0.47	0.21

(2) Subpart C—Open Formation—Wet—PSNS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of lead used	
	English units—pounds per 1,000,000 pounds of lead used	
Copper	0.067	0.032
Lead	0.014	0.006

(3) Subpart C—Plate Soak—PSNS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of lead used	
	English units—pounds per 1,000,000 pounds of lead used	
Copper	0.026	0.012
Lead	0.005	0.002

(4) Subpart C—Battery Wash—Detergent—PSNS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of lead used	
	English units—pounds per 1,000,000 lb of lead used	
Copper	0.576	0.274
Lead	0.126	0.058

(5) Subpart C—Direct Chill Lead Casting—PSNS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of lead used	
	English units—pounds per 1,000,000 lb of lead used	
Copper	0.000256	0.000122
Lead	0.000056	0.000026

(6) Subpart C—Mold Release Formulation—PSNS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of lead used	
	English units—pounds per 1,000,000 lb of lead used	
Copper	0.007	0.0037
Lead	0.0017	0.0008

(7) Subpart C—Truck Wash—PSNS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of lead in trucked batteries	
	English units—pounds per 1,000,000 pounds of lead in trucked batteries	
Copper	0.006	0.003
Lead	0.001	0.0007

(8) Subpart C—Laundry—PSNS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of lead used	
	English units—pounds per 1,000,000 pounds of lead used	
Copper	0.14	0.07
Lead	0.03	0.01

(9) Subpart C—Miscellaneous Wastewater Streams—PSNS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of lead used	
	English units—pounds per 1,000,000 pounds of lead used	
Copper	0.39	0.19
Lead	0.085	0.039

(b) There shall be no discharge allowance for process wastewater pollutants from any battery manufacturing operations other than those battery manufacturing operations listed above.

§ 461.36 [Reserved]

Subpart D—Leclanche Subcategory

§ 461.40 Applicability; description of the Leclanche subcategory.

This subpart applies to discharges to waters of the United States, and introductions of pollutants into publicly owned treatment works from manufacturing Leclanche type batteries (zinc anode batteries with acid electrolyte).

§ 461.41–461.42 [Reserved]

§ 461.43 New source performance standards (NSPS).

(a) The discharge of wastewater pollutants from any new source subject to this subpart shall not exceed the standards set forth below:

(1) Subpart D—Foliar Battery Miscellaneous Wash—NSPS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of cells produced	
	English units—pounds per 1,000,000 lb of cells produced	
Mercury	0.010	0.004
Zinc	0.067	0.030
Manganese	0.019	0.015
Oil and grease	0.66	0.66
TSS	0.99	0.79
pH	(1)	(1)

1 Within the range of 7.5 to 10.0 at all times.

(b) There shall be no discharge allowance for process wastewater pollutants from any battery manufacturing operation other than those battery manufacturing operations listed above.

§ 461.44 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 listed below:

(1) Subpart D—Foliar Battery Miscellaneous Wash—PSES.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of cells produced	
	English units—pounds per 1,000,000 pounds of cells produced	
Mercury	0.10	0.004
Zinc	0.067	0.030
Manganese	0.019	0.015

(b) There shall be no discharge allowance for process wastewater pollutants from any battery manufacturing operation other than those battery manufacturing operations listed above.

§ 461.45 Pretreatment standards for new sources (PSNS).

(a) Except as provided in § 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 listed below.

(1) Subpart D—Foliar Battery Miscellaneous Wash—PSNS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of cells produced	
	English units—pounds per 1,000,000 pounds of cells produced	
Mercury	0.010	0.004
Zinc	0.067	0.030
Manganese	0.019	0.015

(b) There shall be no discharge allowance for process wastewater pollutants from any battery manufacturing operation other than those battery manufacturing operations listed above.

§ 461.46 [Reserved]

Subpart E—Lithium Subcategory

§ 461.50 Applicability; description of the lithium subcategory.

This subpart applies to discharges to waters of the United States and introduction of pollutants into publicly owned treatment works from the manufacturing of lithium anode batteries.

§§ 461.51–461.52 [Reserved]

§ 461.53 New Source performance standards (NSPS).

(a) The discharge of wastewater pollutants from any new source subject to this subpart shall not exceed the standards set forth below:

(1) Subpart E—Lead Iodide Cathodes—NSPS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of lead	
	English units—pounds per 1,000,000 pounds of lead	
Chromium	23.34	9.46
Lead	17.68	8.20
Iron	75.70	38.48
TSS	946.2	756.96
pH	(1)	(1)

1 Within the range of 7.5–10.0 at all times.

(2) Subpart E—Iron Disulfide Cathodes—NSPS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of iron disulfide	
	English units—pounds per 1,000,000 pounds of iron disulfide	
Chromium	2.79	1.13
Lead	2.11	0.98
Iron	9.05	4.60
TSS	113.1	90.5
pH	(1)	(1)

1 Within the range of 7.5–10.0 at all times.

(3) Subpart E—Miscellaneous Wastewater Streams—NSPS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of cells produced	
	English units—pounds per 1,000,000 pounds of cells produced	
Chromium	0.039	0.016
Lead	0.030	0.014
Iron	0.129	0.066
TSS	1.62	1.30
pH	(1)	(1)

1 Within the range of 7.5–10.0 at all times.

(4) Subpart E—Air Scrubbers—NSPS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of cells produced	
	English units—pounds per 1,000,000 pounds of cells produced	
TSS	434.0	207.0
pH	(1)	(1)

1 Within the range of 7.5–10.0 at all times.

(b) There shall be no discharge allowance for process wastewater pollutants from any battery manufacturing operation other than those battery manufacturing operations listed above.

§ 461.54 [Reserved]

§ 461.55 Pretreatment standards for new sources (PSNS).

(a) Except as provided in § 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 listed below:

(1) Subpart E—Lead Iodide Cathodes—PSNS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of lead	
	English units—pounds per 1,000,000 pounds of lead	
Chromium	23.34	9.46
Lead	17.66	8.20

(2) Subpart E—Iron Disulfide Cathodes—PSNS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of iron disulfide	
	English units—pounds per 1,000,000 pounds of iron disulfide	
Chromium	2.79	1.13
Lead	2.11	0.93

(3) Subpart E—Miscellaneous Wastewater Streams—PSNS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of cells produced	
	English units—pounds per 1,000,000 pounds of cells produced	
Chromium	0.039	0.016
Lead	0.030	0.014

(b) There shall be no discharge allowance for process wastewater pollutants from any battery manufacturing operation other than those battery manufacturing operations listed above.

§ 461.56 [Reserved]

Subpart F—Magnesium Subcategory

§ 461.60 Applicability; description of the magnesium subcategory.

This subpart applies to discharges to waters of the United States and introduction of pollutants into publicly owned treatment works from the manufacturing of magnesium anode batteries.

§ 461.61–461.62 [Reserved]

§ 461.63 New source performance standards (NSPS).

(a) The discharge of wastewater pollutants from any new source subject to this subpart shall not exceed the standards set forth below:

(1) Subpart F—Silver Chloride Cathodes—Chemically Reduced—NSPS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of silver processed	
	English units—pounds per 1,000,000 lb of silver processed	
Lead	22.93	10.65
Silver	23.75	9.83
Iron	98.28	49.96
TSS	1,228.5	982.8
COD	4,095.0	1,999.0
pH	(1)	(1)

[1] Within the range of 7.5–10.0 at all times.

(2) Subpart F—Silver Chloride Cathodes—Electrolytic—NSPS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of silver processed	
	English units—pounds per 1,000,000 lb of silver processed	
Lead	40.6	18.9
Silver	42.1	17.4
Iron	174.0	88.5
TSS	2,175.0	1,740.0
COD	7,250.0	3,540.0
pH	(1)	(1)

[1] Within the range of 7.5–10.0 at all times.

(3) Subpart F—Cell Testing—NSPS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of cells produced	
	English units—pounds per 1,000,000 lb of cells produced	
Lead	19.5	7.89
Silver	15.3	6.31
Iron	63.1	32.1
TSS	789.0	631.2
COD	2,630.0	1,290.0
pH	(1)	(1)

[1] Within the range of 7.5–10.0 at all times.

(4) Subpart F—Floor and Equipment Wash—NSPS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of cells produced	
	English units—pounds per 1,000,000 lb of cells produced	
Lead	0.026	0.012
Silver	0.027	0.011
Iron	0.112	0.057
COD	4.70	2.30
TSS	1.41	1.13
pH	(1)	(1)

[1] Within the range of 7.5–10.0 at all times.

(5) Subpart F—Air Scrubber—NSPS.

BAT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of cells produced	
	English units—pounds per 1,000,000 lb of cells produced	
TSS	8,467.0	4,030.0
pH	(1)	(1)

[1] Within the range of 7.5–10.0 at all times.

(b) There shall be no discharge allowance for process wastewater pollutants from any battery manufacturing operation other than those battery manufacturing operations listed above.

§ 461.64 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 listed below:

(1) Subpart F—Silver Chloride Cathodes—Chemically Reduced—PSES.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of silver processed	
	English units—pounds per 1,000,000 pounds of silver processed	
Lead	1,032.36	491.60
Silver	1,007.78	417.86

(2) Subpart F—Silver Chloride Cathodes—Electrolytic—PSES.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of silver processed	
	English units—pounds per 1,000,000 pounds of silver processed	
Lead	60.9	29.0
Silver	59.5	24.7

(3) Subpart F—Cell Testing—PSES.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of cells produced	
	English units—pounds per 1,000,000 pounds of cells produced	
Lead	22.1	10.5
Silver	21.6	8.9

(4) Subpart F—Floor and Equipment Wash—PSES.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of cells produced	
	English units—pounds per 1,000,000 pounds of cells produced	
Lead	0.039	0.018
Silver	0.038	0.015

(b) There shall be no discharge allowance for process wastewater pollutants from any battery manufacturing operation other than those battery manufacturing operations listed above.

§ 461.65 Pretreatment standards for new sources (PSNS).

(a) Except as provided in § 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 listed below:

(1) Subpart F—Silver Chloride Cathodes—Chemically Reduced—PSNS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of silver processed	
	English units—pounds per 1,000,000 pounds of silver processed	
Lead	22.93	10.65
Silver	23.75	9.83

(2) Subpart F—Silver Chloride Cathodes—Electrolytic PSNS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of silver processed	
	English units—pounds per 1,000,000 pounds of silver processed	
Lead	40.6	18.9
Silver	42.1	17.4

(3) Subpart F—Cell Testing—PSNS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of cells produced	
	English units—pounds per 1,000,000 pounds of cells produced	
Lead	19.5	7.89
Silver	15.3	6.31

(4) Subpart F—Floor and Equipment Wash—PSNS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of cells produced	
	English units—pounds per 1,000,000 pounds of cells produced	
Lead	0.026	0.012
Silver	0.027	0.011

(b) There shall be no discharge allowance for process wastewater pollutants from any battery manufacturing operation other than those battery manufacturing operations listed above.

§ 461.66 [Reserved]

Subpart G—Zinc Subcategory

§ 461.70 Applicability; description of the zinc subcategory.

This subpart applies to discharges to waters of the United States, and introductions of pollutants into publicly owned treatment works from the manufacturing of zinc anode batteries.

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

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

(1) Subpart G—Wet Amalgamated Powder Anodes.

BPT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of zinc	
	English units—pounds per 1,000,000 lb of zinc	
Chromium	1.67	0.68
Mercury	0.95	0.39
Silver	1.56	0.65
Zinc	5.55	2.32
Manganese	2.58	1.10
Oil and grease	76.0	45.0
TSS	155.8	74.1
pH	(1)	(1)

[1] Within the range of 7.5—10.0 at all times.

(2) Subpart G—Gelled Amalgam Anodes.

BPT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of zinc	
	English units—pounds per 1,000,000 lb of zinc	
Chromium	0.30	0.12
Mercury	0.17	0.07
Silver	0.28	0.12
Zinc	0.99	0.42
Manganese	0.46	0.20
Oil and grease	13.6	8.16
TSS	27.9	13.26
pH	(1)	(1)

[1] Within the range of 7.5—10.0 at all times.

(3) Subpart G—Zinc Oxide, Formed Anodes.

BPT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of zinc	
	English units—pounds per 1,000,000 pounds of zinc	
Chromium	62.9	25.7
Mercury	35.8	14.3
Silver	58.7	24.3
Zinc	208.8	87.2
Manganese	97.2	41.5
Oil and grease	2,860.0	1,716.0
TSS	5,863.0	2,789.0
pH	(1)	(1)

[1] Within the range of 7.5-10.0 at all times.

(4) Subpart G—Electrodeposited Anodes.

BPT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of zinc deposited	
	English units—pounds per 1,000,000 pounds of zinc deposited	
Chromium	1,404.0	574.0
Mercury	798.0	319.0
Silver	1,309.0	543.0
Zinc	4,657.0	1,946.0
Manganese	2,169.0	925.0
Oil and grease	63,800.0	38,280.0
TSS	130,700.0	62,210.0
pH	(1)	(1)

[1] Within the range of 7.5–10.0 at all times.

(5) Subpart G—Silver Powder, Formed Cathodes.

BPT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of silver applied	
	English units—pounds per 1,000,000 pounds of silver applied	
Chromium	86.2	35.3
Mercury	49.0	19.6
Silver	80.4	33.3
Zinc	286.2	119.6
Manganese	133.3	56.8
Oil and grease	3,920.0	2,350.0
TSS	8,036.0	3,822.0
pH	(1)	(1)

[1] Within the range of 7.5–10.0 at all times.

(6) Subpart G—Silver Oxide Powder, Formed Cathodes.

BPT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of silver applied	
	English units—pounds per 1,000,000 pounds of silver applied	
Chromium	57.7	23.6
Mercury	32.8	13.1
Silver	53.7	22.3
Zinc	191.3	79.9
Manganese	89.1	38.0
Oil and grease	2,620.0	1,570.0
TSS	5,370.0	2,554.0
pH	(1)	(1)

[1] Within the range of 7.5–10.0 at all times.

(7) Subpart G—Silver Peroxide Cathodes.

BPT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of silver applied	
	English units—pounds per 1,000,000 pounds of silver applied	
Chromium	13.8	5.65
Mercury	7.85	3.14
Silver	12.9	5.34
Zinc	45.8	19.2
Manganese	21.4	9.11
Oil and Grease	628.0	377.0
TSS	1,287.0	612.0
pH	(1)	(1)

[1] Within the range of 7.5–10.0 at all times.

(8) Subpart G—Nickel Impregnated Cathodes.

BPT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of nickel applied	
	English units—pounds per 1,000,000 pounds of nickel applied	
Chromium	721.8	235.2
Mercury	410.0	164.0
Nickel	3,149.0	2,083.0
Silver	672.4	279.0
Zinc	2,394.4	1,000.4
Manganese	1,115.2	475.6
Oil and Grease	32,600.0	19,680.0
TSS	67,240.0	31,980.0
pH	(1)	(1)

[1] Within the range of 7.5–10.0 at all times.

(9) Subpart G—Miscellaneous Wastewater Streams.

BPT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of cells produced	
	English units—pounds per 1,000,000 pounds of cells produced	
Chromium	3.85	1.58
Cyanide	2.54	1.05
Mercury	2.19	0.88
Nickel	16.82	11.12
Silver	3.59	1.49
Zinc	12.79	5.34
Manganese	5.96	2.54
Oil and Grease	175.20	105.12
TSS	359.10	170.82
pH	(1)	(1)

[1] Within the range of 7.5–10.0 at all times.

(10) Subpart G—Silver Etch.

BPT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of silver processed	
	English units—pounds per 1,000,000 pounds of silver processed	
Chromium	21.6	8.84
Mercury	12.3	4.91
Silver	20.2	8.35
Zinc	71.7	30.0
Manganese	33.4	14.3
Oil and Grease	682.0	583.2
TSS	2,013.1	957.5
pH	(1)	(1)

[1] Within the range of 7.5–10.0 at all times.

(11) Subpart G—Silver Peroxide Production.

BPT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of silver peroxide produced	
	English units—pounds per 1,000,000 pounds of silver in silver peroxide produced	
Chromium	23.0	9.40
Mercury	13.1	5.22
Silver	21.4	8.83
Zinc	76.2	31.80
Manganese	35.5	15.10
Oil and grease	1,044.0	627.00
TSS	2,140.0	1,018.00
pH	(1)	(1)

[1] Within the range of 7.5–10.0 at all times.

(12) Subpart G—Silver Powder Production.

BPT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of silver powder produced	
	English units—pounds per 1,000,000 pounds of silver powder produced	
Chromium	9.33	3.82
Mercury	5.30	2.12
Silver	8.63	3.61
Zinc	30.95	12.93
Manganese	14.42	6.15
Oil and grease	424.0	254.40
TSS	869.0	413.40
pH	(1)	(1)

[1] Within the range of 7.5–10.0 at all times.

(b) There shall be no discharge allowance for process wastewater pollutants from any battery manufacturing operation other than those battery manufacturing operations listed above.

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

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

(1) Subpart G—Wet Amalgamated Powder Anodes.

BAT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of zinc English units—pounds per 1,000,000 pounds of zinc	
Chromium	0.24	0.099
Mercury	0.14	0.055
Silver	0.23	0.093
Zinc	0.80	0.34
Manganese	0.37	0.16

(2) Subpart G—Gelled Amalgam Anodes.

BAT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of zinc English units—pounds per 1,000,000 pounds of zinc	
Chromium	0.030	0.012
Mercury	0.017	0.007
Silver	0.028	0.012
Zinc	0.099	0.042
Manganese	0.046	0.020

(3) Subpart G—Zinc Oxide Formed Anodes.

BAT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of zinc English units—pounds per 1,000,000 pounds of zinc	
Chromium	9.53	3.90
Mercury	5.42	2.17
Silver	8.89	3.68
Zinc	31.64	13.22
Manganese	14.74	6.28

(4) Subpart G—Electrodeposited Anodes.

BAT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of zinc deposited English units—pounds per 1,000,000 pounds of zinc deposited	
Chromium	94.47	38.65
Mercury	53.68	21.47
Silver	88.03	36.50
Zinc	313.46	130.97
Manganese	146.00	62.26

(5) Subpart G—Silver Powder Formed Cathodes.

BAT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of silver applied English units—pounds per 1,000,000 pounds of silver applied	
Chromium	13.07	5.35
Mercury	7.43	2.97
Silver	12.18	5.05
Zinc	43.36	18.12
Manganese	20.20	8.61

(6) Subpart G—Silver Oxide Powder Formed Cathodes.

BAT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of silver applied English units—pounds per 1,000,000 pounds of silver applied	
Chromium	8.73	3.57
Mercury	4.96	1.99
Silver	8.14	3.37
Zinc	28.98	12.11
Manganese	13.50	5.76

(7) Subpart G—Silver Peroxide Cathodes.

BAT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of silver applied English units—pounds per 1,000,000 pounds of silver applied	
Chromium	2.09	0.87
Mercury	1.19	0.48
Silver	1.95	0.81
Zinc	6.95	2.90
Manganese	3.24	1.38

(8) Subpart G—Nickel Impregnated Cathodes.

BAT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of nickel applied English units—pounds per 1,000,000 pounds of nickel applied	
Chromium	88.0	36.0
Mercury	50.0	20.0
Nickel	384.0	254.0
Silver	82.0	34.0
Zinc	292.0	122.0
Manganese	136.0	58.0

(9) Subpart G—Miscellaneous Wastewater Streams.

BAT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of cells produced English units—pounds per 1,000,000 pounds of cells produced	
Chromium	0.57	0.23
Cyanide	0.38	0.16
Mercury	0.32	0.13
Nickel	2.48	1.64
Silver	0.53	0.22
Zinc	1.88	0.79
Manganese	0.88	0.37

(10) Subpart G—Silver Etch.

BAT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of silver processed English units—pounds per 1,000,000 pounds of silver processed	
Chromium	3.27	1.34
Mercury	1.86	0.74
Silver	3.05	1.26
Zinc	10.86	4.54
Manganese	5.06	2.16

(11) Subpart G—Silver Peroxide Production.

BAT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of silver peroxide produced English units—pounds per 1,000,000 pounds of silver in silver peroxide produced	
Chromium	3.48	1.42
Mercury	1.98	0.79
Silver	3.24	1.34
Zinc	11.55	4.83
Manganese	5.38	2.29

(12) Subpart G—Silver Powder Production.

BAT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of silver powder produced	
	English units—pounds per 1,000,000 pounds of silver powder produced	
Chromium	1.41	0.58
Mercury	0.80	0.32
Silver	1.32	0.55
Zinc	4.69	1.96
Manganese	2.18	0.93

(b) There shall be no discharge allowance for process wastewater pollutants from any battery manufacturing operation other than those battery manufacturing operations listed above.

§ 461.73 New source performance standards. (NSPS).

(a) The discharge of wastewater pollutants from any new source subject to this subpart shall not exceed the standards set forth below:

(1) Subpart G—Zinc Oxide Formed Anodes—NSPS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of zinc	
	English units—pounds per 1,000,000 pounds of zinc	
Chromium	4.55	1.97
Mercury	2.82	1.19
Silver	4.55	1.97
Zinc	0.87	0.39
Manganese	6.50	4.98
Oil and grease	216.7	216.7
TSS	325.0	260.0
pH	(1)	(1)

[1] Within the limits of 7.5–10.0 at all times.

(2) Subpart G—Electrodeposited Anodes—NSPS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of zinc deposited	
	English units—pounds per 1,000,000 pounds of zinc deposited	
Chromium	45.09	19.54
Mercury	27.91	11.81
Silver	45.09	19.54
Zinc	8.59	3.86
Manganese	64.41	49.38
Oil and grease	2,147.00	2,147.00
TSS	3,220.50	2,576.40
pH	(1)	(1)

[1] Within the limits of 7.5–10.0 at all times.

(3) Subpart G—Silver Powder Formed Cathodes—NSPS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of silver applied	
	English units—pounds per 1,000,000 pounds of silver applied	
Chromium	6.24	2.70
Mercury	3.86	1.63
Silver	6.24	2.70
Zinc	1.19	0.53
Manganese	8.91	6.83
Oil & Grease	237.00	237.00
TSS	445.5	356.40
pH	(1)	(1)

[1] Within the limits of 7.5–10.0 at all times.

(4) Subpart G—Silver Oxide Powder Formed Cathodes—NSPS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of silver applied	
	English units—pounds per 1,000,000 pounds of silver applied	
Chromium	4.17	1.81
Mercury	2.58	1.09
Silver	4.17	1.81
Zinc	0.79	0.36
Manganese	5.96	4.57
Oil & Grease	198.5	198.5
TSS	297.8	238.2
pH	(1)	(1)

[1] Within the limits of 7.5–10.0 at all times.

(5) Subpart G—Silver Peroxide Cathodes—NSPS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of silver applied	
	English units—pounds per 1,000,000 pounds of silver applied	
Chromium	1.00	0.43
Mercury	0.62	0.26
Silver	1.00	0.43
Zinc	0.19	0.09
Manganese	1.43	1.09
Oil & Grease	47.6	47.6
TSS	71.4	57.1
pH	(1)	(1)

[1] Within the limits of 7.5–10.0 at all times.

(6) Subpart G—Nickel Impregnated Cathodes—NSPS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of nickel applied	
	English units—pounds per 1,000,000 pounds of nickel applied	
Chromium	42.0	18.2
Mercury	26.0	11.0
Nickel	42.0	18.2
Silver	42.0	18.2
Zinc	8.0	3.6
Manganese	60.0	46.0
Oil & Grease	2,000.0	2,000.0
TSS	3,000.0	2,400.00

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
pH	(1)	(1)

[1] Within the limits of 7.5–10.0 at all times.

(7) Subpart G—Miscellaneous Wastewater Streams—NSPS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of cells produced	
	English units—pounds per 1,000,000 pounds of cells produced	
Chromium	0.27	0.12
Cyanide	0.033	0.016
Mercury	0.17	0.07
Nickel	0.27	0.12
Silver	0.27	0.12
Zinc	0.05	0.02
Manganese	0.39	0.30
Oil & Grease	12.90	12.90
TSS	19.35	15.48
pH	(1)	(1)

[1] Within the limits of 7.5–10.0 at all times.

(8) Subpart G—Silver Etch—NSPS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of silver processed	
	English units—pounds per 1,000,000 pounds of silver processed	
Chromium	1.56	0.68
Mercury	0.97	0.41
Silver	1.56	0.68
Zinc	0.30	0.13
Manganese	2.23	1.71
Oil & Grease	74.40	74.40
TSS	111.60	83.28
pH	(1)	(1)

[1] Within the limits of 7.5–10.0 at all times.

(9) Subpart G—Silver Peroxide Production—NSPS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of silver in silver peroxide produced	
	English units—pounds per 1,000,000 pounds of silver in silver peroxide produced	
Chromium	1.66	0.72
Mercury	1.03	0.44
Silver	1.66	0.72
Zinc	0.32	0.14
Manganese	2.37	1.82
Oil and grease	79.10	79.10
TSS	118.65	94.92
pH	(1)	(1)

[1] Within the limits of 7.5–10.0 at all times.

(10) Subpart G—Silver Powder Production—NSPS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of silver powder produced	
	English unites—pounds per 1,000,000 pounds of silver powder produced	
Chromium	0.67	0.29
Mercury	0.42	0.18
Silver	0.67	0.29
Zinc	0.13	0.06
Manganese	0.96	0.74
Oil and grease	32.10	32.10
TSS	48.15	38.52
pH	(1)	(1)

[1] Within the limits of 7.5–10.0 at all times.

(b) There shall be no discharge allowance for process wastewater pollutants from any battery manufacturing operation other than those battery manufacturing operations listed above.

§ 461.74 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:

(1) Subpart G—Wet Amalgamated Powder Anode—PSES.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of zinc	
	English units—pounds per 1,000,000 pounds of zinc	
Chromium	0.24	0.099
Mercury	0.14	0.055
Silver	0.23	0.093
Zinc	0.80	0.34
Manganese	0.37	0.16

(2) Subpart G—Gelled Amalgam Anodes—PSES.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of zinc	
	English units—pounds per 1,000,000 pounds of zinc	
Chromium	0.030	0.12
Mercury	0.017	0.006
Silver	0.028	0.012
Zinc	0.099	0.042
Manganese	0.046	0.020

(3) Subpart G—Zinc Oxide Formed Anodes—PSES.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of zinc	
	English units—pounds per 1,000,000 pounds of zinc	
Chromium	9.53	3.90
Mercury	5.42	2.17
Silver	8.89	3.68
Zinc	31.64	13.22
Manganese	14.74	6.28

(4) Subpart G—Electrodeposited Anodes—PSES.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of zinc deposited	
	English units—pounds per 1,000,000 pounds of zinc deposited	
Chromium	94.47	38.65
Mercury	53.68	21.47
Silver	88.03	36.50
Zinc	313.46	130.97
Manganese	146.00	62.26

(5) Subpart G—Silver Powder Formed Cathodes—PSES.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of silver applied	
	English units—pounds per 1,000,000 pounds of silver applied	
Chromium	13.07	5.35
Mercury	7.43	2.97
Silver	12.18	5.05
Zinc	43.36	18.12
Maganese	20.20	8.61

(6) Subpart G—Silver Oxide Powder Formed Cathodes—PSES.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of silver applied	
	English units—pounds per 1,000,000 pounds of silver applied	
Chromium	8.73	3.57
Mercury	4.96	1.99
Silver	8.14	3.37
Zinc	28.98	12.11
Manganese	13.50	5.76

(7) Subpart G—Silver Peroxide Cathodes—PSES.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of silver applied	
	English units—pounds per 1,000,000 pounds of silver applied	
Chromium	2.09	0.87
Mercury	1.19	0.48
Silver	1.95	0.81
Zinc	6.95	2.90
Manganese	3.24	1.38

(8) Subpart G—Nickel Impregnated Cathodes—PSES.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of nickel applied	
	English units—pounds per 1,000,000 pounds of nickel applied	
Chromium	88.0	38.0
Mercury	50.0	20.0
Nickel	384.0	254.0
Silver	82.0	34.0
Zinc	292.0	122.0
Manganese	136.0	58.0

(9) Subpart G—Miscellaneous Wastewater Streams—PSES.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of cells produced	
	English units—pounds per 1,000,000 pounds of cells produced	
Chromium	0.57	0.23
Cyanide	0.38	0.16
Mercury	0.32	0.13
Nickel	2.48	1.64
Silver	0.53	0.22
Zinc	1.88	0.79
Manganese	0.88	0.37

(10) Subpart G—Silver Etch—PSES.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of silver processed	
	English units—pounds per 1,000,000 pounds of silver processed	
Chromium	3.27	1.34
Mercury	1.88	0.74
Silver	3.05	1.26
Zinc	10.86	4.54
Manganese	5.06	2.16

(11) Subpart G—Silver Peroxide Production—PSES.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of silver in silver peroxide produced	
	English units—pounds per 1,000,000 pounds of silver in silver peroxide produced	
Chromium	3.48	1.42
Mercury	1.98	0.79
Silver	3.24	1.34
Zinc	11.55	4.83
Manganese	5.38	2.29

(12) Subpart G—Silver Powder Production—PSES.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of silver powder produced	
	English units—pounds per 1,000,000 pounds of silver powder produced	
Chromium	1.41	0.58
Mercury	0.80	0.32
Silver	1.32	0.55
Zinc	4.69	1.96
Manganese	2.18	0.93

(b) There shall be no discharge allowance for process wastewater pollutants from any battery manufacturing operation other than those battery manufacturing operations listed above.

§ 461.75 Pretreatment standards for new sources (PSNS).

(a) Except as provided in § 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 listed below:

(1) Subpart G—Zinc Oxide Formed Anodes—PSNS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of zinc	
	English units—pounds per 1,000,000 pounds of zinc	
Chromium	4.55	1.97
Mercury	2.82	1.19
Silver	4.55	1.97
Zinc	0.87	0.39
Manganese	6.50	4.98

(2) Subpart G—Electrodeposited Anodes—PSNS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of zinc deposited	
	English units—pounds per 1,000,000 pounds of zinc deposited	
Chromium	45.03	19.54
Mercury	27.91	11.81
Silver	45.03	19.54
Zinc	8.59	3.65
Manganese	64.41	49.33

(3) Subpart G—Silver Powder Formed Cathodes—PSNS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of silver applied	
	English units—pounds per 1,000,000 pounds of silver applied	
Chromium	6.24	2.70
Mercury	3.86	1.63
Silver	6.24	2.70
Zinc	1.19	0.53
Manganese	8.91	6.83

(4) Subpart G—Silver Oxide Powder Formed Cathodes—PSNS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of silver applied	
	English units—pounds per 1,000,000 pounds of silver applied	
Chromium	4.17	1.81
Mercury	2.59	1.09
Silver	4.17	1.81
Zinc	0.79	0.36
Manganese	5.96	4.57

(5) Subpart G—Silver Peroxide Cathodes—PSNS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of silver applied	
	English units—pounds per 1,000,000 pounds of silver applied	
Chromium	1.00	0.43
Mercury	0.62	0.26
Silver	1.00	0.43
Zinc	0.19	0.08
Manganese	1.43	1.09

(6) Subpart G—Nickel Impregnated Cathodes —PSNS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of nickel applied	
	English units—pounds per 1,000,000 pounds of nickel applied	
Chromium	42.0	18.2
Mercury	26.0	11.0
Nickel	42.0	18.2
Silver	42.0	18.2
Zinc	8.0	3.6
Manganese	60.0	46.0

(7) Subpart G—Miscellaneous Wastewater Streams—PSNS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of cells produced	
	English units—pounds per 1,000,000 pounds of cell produced	
Chromium	0.27	0.12
Cyanide	0.039	0.016
Mercury	0.17	0.07
Nickel	0.27	0.12
Silver	0.27	0.12
Zinc	0.05	0.02
Manganese	0.39	0.30

(8) Subpart G—Silver Etch—PSNS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of silver processed	
	English units—pounds per 1,000,000 pounds of silver processed	
Chromium	1.56	0.68
Mercury	0.97	0.41
Silver	1.56	0.68
Zinc	0.30	0.13
Manganese	2.23	1.71

(9) Subpart G—Silver Peroxide Production—PSNS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of silver peroxide produced	
	English units—pounds per 1,000,000 pounds of silver in silver peroxide produced	
Chromium	1.66	0.72
Mercury	1.03	0.44
Silver	1.66	0.72
Zinc	0.32	0.14
Manganese	2.37	1.82

(10) Subpart G—Silver Powder Production—PSNS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of silver powder produced	
	English units—pounds per 1,000,000 pounds of silver powder produced	
Chromium	0.67	0.29
Mercury	0.42	0.18
Silver	0.67	0.29
Zinc	0.13	0.06
Manganese	0.96	0.74

(b) There shall be no discharge allowance for process wastewater pollutants from any battery manufacturing operation other than those battery manufacturing operations listed above.

§461.76 [Reserved]

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