# **ENVIRONMENTAL PROTECTION** AGENCY

# 40 CFR Part 421

26352

## Nonferrous Metals Manufacturing Point Source Category; Effluent Limitations Guidelines, Pretreatment Standards, and New Source Performance Standards

**AGENCY:** Environmental Protection Agency (EPA).

# ACTION: Proposed regulation.

SUMMARY: EPA is proposing effluent limitations guidelines and standards under the Clean Water Act to limit effluent discharges to waters of the United States and the introduction of pollutants into publicly owned treatment works (POTW) from particular nonferrous metals manufacturing facilities. The Clean Water Act and a consent decree require EPA to propose and promulgate this regulation. The purpose of this action is to propose effluent limitations based on best practicable technology and best available technology, new source performance standards based on best demonstrated technology, and pretreatment standards for existing and new indirect dischargers. After considering comments received in response to this proposal, EPA will promulgate a final rule.

DATES: Comments on this proposal must be submitted by August 27, 1984. ADDRESSES: Send comments to: Mr. lames R. Berlow, Effluent Guidelines Division (WH-552), U.S. Environmental Protection Agency, 401 M Street, SW., Washington, DC 20460, Attention: Nonferrous Metals Manufacturing Comments. Technical information and copies of technical documents may be obtained from the National Technical Information Service, Springfield, Virginia 22161 (703/487–6000), or from Mr. James R. Berlow, Effluent Guidelines Division, U.S. Environmental Protection Agency 401 M Street, SW., Washington, DC 20460 or call 202/382-7151. The economic analysis may be obtained from Mr. Mark Kohorst, Economic Analysis Staff (WH-586), U.S. Environmental Protection Agency, 401 M Street SW., Washington, DC 20460, or call 202/382-5397 FOR FURTHER INFORMATION CONTACT:

# Ernst P Hall, 202/382-7126. SUPPLEMENTARY INFORMATION:

#### <sup>1</sup> Overview

This preamble describes the legal authority and background, the technical and economic bases, and other aspects of the proposed regulations. It solicits

comments on specific areas of interest. The abbreviations, acronyms, and other terms used in the Supplementary Information section are defined in Appendix A to this notice.

These proposed regulations are supported by three major documents available on a limited basis from EPA and the National Technical Information Service. 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 General Development Document for Effluent Limitations Guidelines and Standards for the Nonferrous Metals Manufacturing Phase II Points Source Category and the subcategory supplements. However, substantial portions of the subcategory supplements have been claimed confidential for fourteen subcategories. As a result, EPA cannot make those portions of these fourteen supplements public without first following the procedures set out in 40 CFR Part 2. The Agency's economic analysis is found in Economic Impact Analysis of Effluent Limitations Guidelines and Standards for the Nonferrous Metals Manufacturing Point Source Category.

The supporting information and all comments on this proposal will be available for inspection and copying at the EPA Public Information Reference Unit, Room 2402 (Rear) (EPA Library). The EPA public information regulation (40 CFR Part 2) provides that a reasonable fee may be charged for copying.

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- I. Legal Authority

EPA is proposing the regulation described in this notice under the authority of sections 301, 304, 306, 307, 308, and 501 of the Clean Water Act (the Federal Water Pollution Control Act Amendments of 1972, 33 U.S.C. 1251 et seq., as amended by the Clean Water Act of 1977, Pub. L. 95-217) ("the Act"). These regulations also are proposed in response to the Settlement Agreement in Natural Resources Defense Council, Inc. v. Train, 8 ERC 2120 (D.D.C. 1976). modified, 12 ERC 1833 (D.C.C. 1979), modified by additional orders of October 26, 1982, August 2, 1983, and January 6, 1984.

## **II. Background**

# A. The Clean Water Act and the Settlement Agreement

The Federal Water Pollution Control Act Amendments of 1972 established a comprehensive program to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters," section 101(a). By July 1, 1977, existing industrial dischargers were required to achieve "effluent limitations requiring the application of the best

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

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

EPA was unable to promulgate many of these regulations by the dates contained in the Act. In 1976, EPA was sued by several environmental groups, and in settlement of this lawsuit, EPA and the plaintiffs executed a "Settlement Agreement" which was approved by the District Court. This Agreement required EPA to develop a program and adhere to a schedule for promulgating for 21 major industries BAT effluent limitations guidelines, pretreatment standards, and new source performance standards for 65 "priority" pollutants and classes of pollutants. See *Natural Resources Defense Council, Inc.* v. *Train,* 8 ERC 2120 (D.D.C. 1976), *modified,* 12 ERC 1833 (D.D.C. 1979), modified by additional orders of October 26, 1982, August 2, 1983, and January 6, 1984.

On December 27, 1977, the President signed into law the Clean Water Act of 1977. Although this law makes several important changes in the Federal water pollution control program, its most significant feature is its incorporation into the Act of several of the basic elements of the Settlement Agreement program for toxic pollution control. Sections 301(b)(2)(A) and 301(b)(2)(C) of the Act now require the achievement by July 1, 1984 of effluent limitations requiring application of BAT for "toxic" pollutants, including the 65 "priority" pollutants and classes of pollutants which Congress declared "toxic" under section 307(a) of the Act. Likewise, EPA's programs for new source performance standards and pretreatment standards are now aimed principally at toxic pollutant controls. Moreover, to strengthen the toxics control program, section 304(e) of the Act authorizes the Administrator to prescribe "best management practices" ("BMP") to prevent the release of toxic and hazardous pollutants from plant site runoff, spillage or leaks, sludge or waste disposal, and drainage from raw material storage associated with, or ancillary to, the manufacturing or treatment process.

The 1977 Amendments added section 301(b)(2)(E) to the Act establishing "best conventional pollutant control technology" (BCT) for discharges of conventional pollutants from existing industrial point sources. Conventional pollutants are those mentioned specifically in section 304(a)(4) (biochemical oxygen demanding pollutants (BOD5), total suspended solids (TSS), fecal coliform, and pH), and any additional pollutants defined by the Administrator as "conventional." (To date, the Agency has added one such pollutant, oil and grease, 44 FR 44501, July 30, 1979.)

BCT is not an additional limitation but replaces BAT for the control of conventional pollutants. In addition to other factors specified in section 304(b)(4)(B), the Act requires that BCT limitations be assessed in light of a two part "cost-reasonableness" test, *American Paper Institute* v. EPA, 600 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 costeffectiveness of additional industrial treatment beyond BPT. EPA must find that limitations are "reasonable" under both tests before establishing them as BCT. In no case may BCT be less stringent than BPT.

EPA published its methodology for carrying out the BCT analysis on August 29, 1979 (44 FR 50372). 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, 1932 (47 FR 49176), but has not been promulgated as a final rule. We accordingly are not proposing BCT limits for plants in the nonferrous metals manufacturing phase II category at this time. We will await establishing nationally applicable BCT limits for this industry until promulgation of the final methodology for BCT.

For non-toxic, nonconventional pollutants, sections 301 (b)(2)(A) and (b)(2)(F) require achievement of BAT effluent limitations within three years after their establishment or July 1, 1934, whichever is later, but not later than July 1, 1937

The purpose of these proposed regulations is to provide effluent limitations guidelines for BPT and BAT, and to establish NSPS, pretreatment standards for existing sources (PSES). and pretreatment standards for new sources (PSNS), under section 301, 304, 303, 307, and 501 of the Clean Water Act.

# **B.** Prior EPA Regulations

EPA already has promulgated effluent limitations and pretreatment standards for certain nonferrous metals manufacturing subcategories. These regulations, and the technological basis are summarized below.

Nonferrous Phase I. On March 8, 1934 EPA promulgated rules for nonferrous metals manufacturing phase I (49 FR 8742), which established BPT, BAT, NSPS, PSES, and PSNS for 12 subcategories. They are: primary aluminum, copper smelting, copper electrolytic refining, lead, zinc, columbium-tantalum, and tungsten; secondary aluminum, silver, copper, lead and metallurgical acid plants. Bauxite Refining Subcategory. EPA has promulgated BPT, BAT, NSPS, and PSNS in this subcategory 39 FR 12822 (March 26, 1974). BPT, BAT, NSPS, and PSNS are based on zero discharge of process wastewater, but do allow for a monthly net precipitation discharge from red mud impoundments. We are providing notice today that we are considering whether to establish more stringent effluent limitations controlling selected phenolic compounds contained in the net precipitation discharge currently allowed from bauxite refining plants.

Metallurgical Acid Plants. This subcategory was initially established in 1980, and at that time included only acid plants (*i.e.*, plants recovering byproduct sulfuric acid from sulfur dioxide smelter air emissions) associated with primary copper smelting operations. See 45 FR 44926. Primary lead and zinc plants also have associated acid plants; and consequently the applicability of the metallurgical acid plant subcategory was expanded to include these sources in the phase I regulation finalized on March 8, 1984 (49 FR 8742). We are proposing today to amend the existing regulation for metallurgical acid plants by modifying the applicability of the metallurgical acid plant subcategory to include molybdenum acid plants as well.

# C. Overview of the Category

The nonferrous metals manufacturing category is comprised of plants that process ore concentrates and scrap metals contained in spent electroplating solutions, spent catalysts, old jewelry, and various other sources. These plants recover nonferrous metals by increasing the metal purity contained in these materials. Depending on the metal and the desired purity, hydrometallurgical or pyrometallurgical exchange operations may be used to purify and upgrade metal values.

The production of nonferrous metals sometimes occurs at plants that also have processes that are regulated as part of other point source categories. Many of the production operations characterizing the nonferrous metals manufacturing category follow mining and milling operations. The ore mining and dressing category includes the extraction of the ore from the ground and the subsequent beneficiation of the ore including gravity concentration. magnetic separation, electrostatic separation, froth flotation, and leaching to produce ore concentrates. The ore concentrates and scrap materials form the raw materials in the nonferrous metals manufacturing subcategories.

Following smelting, refining, or extraction of metal values included in

the nonferrous metals manufacturing category, the metal or metal salt products are used as raw materials for such operations as forming, alloying, and the manufacture of inorganic chemicals. Operations such as these, where the metal purity is not increased. are covered by other point source categories. In many of the nonferrous metals manufacturing subcategories, the production operations cease with the casting of the smelted or refined metal. Recasting of the metal without refining for use in subsequent forming or alloying operations is covered by the Aluminum Forming, Nonferrous Metals Forming, or Metal Molding and Casting Point Source Categories.

EPA has divided the nonferrous metals category into separate segments (nonferrous metals manufacturing phase I and nonferrous metals manufacturing phase II), in keeping with Agency priorities to regulate initially those plants which generate the largest quantities of toxic pollutants. As a result, EPA promulgated regulations for nonferrous metals manufacturing phase I (49 FR 8742) on March 8, 1984. Twelve subcategories were addressed: primary aluminum, copper smelting, copper electrolytic refining, lead, zinc, columbium-tantalum, and tungsten; secondary aluminum, silver, copper, lead, and metallurgical acid plants.

EPA also has separately studied the forming or casting of nonferrous metals. EPA promulgated regulations for aluminum forming (48 FR 49126) in October, 1983, and for copper forming (48 FR 36942) in August, 1983. Proposed regulations for metal molding and casting (47 FR 51512) were published in November, 1982. Proposed regulations for forming of nonferrous metals other than aluminum and copper (49 FR 8112) were published on March 5, 1984.

Today's rulemaking focuses on the remaining segment of nonferrous metals manufacturing. The proposed regulatory strategy for nonferrous metals manufacturing phase II addresses the following 24 subcategories:

Primary antimony, Bauxite refining, Primary beryllium, Primary boron, Primary cesium and rubidium, Primary and secondary germanium and gallium, Secondary indium, Primary lithium, Primary lithium, Primary magnesium, Secondary mercury, Primary molybdenum and rhenium, Secondary molybdenum and vanadium, Primary mokel and cobalt, Secondary nickel, Primary precious metals and mercury, Secondary precious metals, Primary rare earth metals, Secondary tantalum, Primary and secondary tin, Primary and secondary titanium, Secondary tungsten and cobalt, Secondary uranium, Secondary zinc, and Primary zirconium and hafnium.

EPA is proposing to completely exclude three of these subcategories from regulation. Primary lithium and secondary zinc are excluded because the production of these metals does not require process water, and the production of magnesium does not produce wastewater with treatable concentrations of pollutants. The remaining 21 subcategories in nonferrous metals manufacturing phase II contain 34 primary metals and metal groups, 20 secondary metals and metal groups, and bauxite refining. A group of metals-including six primary metals and five secondary metals-were excluded from regulation in a Paragraph 8 affidavit executed pursuant to the Settlement Agreement on May 10, 1979. These metals were excluded from regulation either because the manufacturing processes do not use water or because they are regulated by toxics limitations and standards in other categories (ferroalloys and inorganic chemicals). Four of these metals which were excluded from regulation on May 10, 1979-primary antimony, primary tin, secondary molybdenum, and secondary tantalum-have since been reconsidered and are now included in this rulemaking based on information received during the data collection portion of the study basic to this rulemaking. An explanation of this, along with an explanation of the revised list of metal production processes proposed for exclusion from regulation is provided in section XVI.

There are 141 plants in the 21 regulated phase II subcategories which EPA estimates employ 13,500 people and annually generate raw wastes containing approximately 905,000 kilograms of toxic pollutants. There are 32 direct dischargers which currently discharge 307,000 kg/yr of toxic pollutants and there are 38 indirect dischargers which currently discharge an additional 67,000 kg/yr of toxics. There are 71 plants in this category that do not discharge process wastewater. In the three subcategories that we are proposing not to regulate there is one direct discharger and 13 plants that do not discharge wastewater.

In developing this regulation, it was necessary to determine whether effluent limitations and standards were appropriate for different segments (subcategories) of the category. 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 and its supplements contain a detailed discussion of these factors and the rationale for subcategorization.

A brief description of each of the 21 subcategories for which regulations are proposed is provided below, with particular emphasis on the sources of wasterwater and the types of pollutants present. Section V of the subcategory supplemental Development Documents provides specific characterization data on each of the wastewater sources.

-We are proposing discharge limitations for each of the wastewater sources identified below. The effluent limitations for an individual plant would then be calculated by considering the discharge allowances for those wastewater sources actually present at the plant. (See discussion of building blocks in section VIII below.)

Primary Antimony. Seven of the eight primary antimony plants in the United States are zero dischargers. One primary antimony plant is a direct discharger. The eight plants are geographically scattered, located in seven states across the country. The oldest plant was built in the 1880's, and three others are more than 30 years old. Two plants have been built within the last 10 years. EPA data show that average plant production is approximately 500 kkg per year of antimony and antimony compounds.

The processes used at a primary antimony production facility depend largely on the raw material used and the final produce desired. Pyrometallurgical processing, practiced at five of the eight primary antimony plants, generates no process wastewater. Hydrometallurgical processing, practiced at the remaining three plants, includes the four basic steps which are discussed below.

The first step involves leaching of the ore concentrate with sodium hydroxide to dissolve the antimony. Solids are removed from the resulting slurry by thickening and filtration. The residue is either disposed of or further processed to recover other metals.

The second step involves autoclaving the clarified solution from the leaching process with oxygen. Autoclaving produces sodium antimonate which is dried, packaged, and sold. The third step involves electrowinning to produce antimony metal from the clarified leaching liquor. Antimony is removed from the solution as cathode metal, and the spent electrolyte is recycled to the leaching operation.

In the fourth step, antimony metal is coverted to antimony trioxide in a fuming furnace. The product of this pyrometallurgical process is captured in a baghouse and sold.

The principal sources of wastewater in the primary antimony subcategory are listed below, alone with the pollutants typically found in each:

(1) Sodium antimonate autoclave wastewater is generated when the clarified solution from leaching is autoclaved. Dissolved antimony is converted to sodium antimonate as a final product. This stream is similar to fouled anolyte and contains suspended solids and toxic metals.

(2) Fouled analyte is generated when a portion of the barren electrowinning solution is discharged. This waste stream contains suspended solids and toxic metals.

Bauxite Refining. Of the eight bauxite refining plants in the United States, three are direct dischargers and five are zero dischargers. Seven of the plants are located in the states of Louisiana, Texas, Arkansas, and Alabama. The other plant is located in the U.S. Virgin Islands. Plant age ranges from 15 to 44 years with an average of about 30 years. EPA data show that plant production ranges from 37,000 to 570,000 kkg per year; one of the plants is closed but continues to discharge and four of the remaining eight plants produce between 200,000 and 300,000 kkg per year, measured as aluminum contained in refined bauxite.

The processes used at a bauxite refinery depend largely on the raw material used and the final product desired. In general, plants use the Bayer process or a variation known as the combination process. The four basic steps in the Bayer process which an individual plant may utilize are discussed below.

The first step involves bauxite grinding and digestion. Bauxite ore is crushed, wet-ground with a caustic solution, and digested with sodium hydroxide or lime and sodium carbonate to convert the alumina in the ore to soluble sodium aluminate. The resulting slurry is cooled in flash tanks from which steam is recovered and returned to the digestor.

The second step involves red mud removal and liquor purification. The digested bauxite suspension contains insoluble residue including iron oxides, silica, and undigested bauxite. This residue, known as red mud, is removed by settling, thickening, and filtration. After washing, the mud is disposed of in a mud impoundment. The combination process is a variation of the Bayer process in which the red mud from highsilica bauxites is sintered and leached to recover alumina. The resulting brown mud is disposed of in a mud impoundment.

In the third step, the purified sodium aluminate solution is cooled and aluminum hydroxide is precipitated in the presence of recycled seed crystals. The remaining spent caustic solution is separated from the hydrate crystals by filtration and recycled to the digestion step after concentration by evaporation and removal of excess salts.

The fourth step involves calcination to convert the hydroxide filter cake to anhydrous alumina. If hydrate is the desired final product, the filter cake is dried under less severe conditions than in calcining.

The principal source of wastewater in the bauxite refining subcategory is listed below, along with the pollutants typically found in it:

(1) Mud impoundment effluent is discharged from the mud disposal lake in areas of net precipitation. The effluent is characterized by high pH and the presence of phenolic compounds.

Primary Bervillium. The primary beryllium industry in the United States currently consists of two plants that are owned by the same company. One of the plants is located in Utah near the beryllium ore mining operations. This facility processes the raw materials to an intermediate product, beryllium hydroxide. The beryllium hydroxide is shipped to the second facility, located in Ohio, where it is further processed to final product forms. The plant which produces beryllium hydroxide in Utah began operations in 1979 and achieves zero discharge through the use of evaporation ponds. The facility in Ohio which produces beryllium metal and other products including beryllium oxide and beryllium copper alloy is a direct discharger which began operations in 1957.

The production of beryllium products can be divided into three distinct operations—production of beryllium hydroxide from beryllium oxide from beryllium hydroxide, and production of beryllium metal from beryllium hydroxide.

Most domestic beryllium is extracted from bertrandite ore mined in Utah. Imported and domestically produced beryl ore is another potential raw material for the primary beryllium industry.

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Bertrandite ore is first wet ground and screened to form a slurry which is leached with a sulfuric acid solution. The mixture is washed in countercurrent thickeners. The sludge from the thickeners is dewatered in a filter and discarded. The thickener supernatant next enters a solvent extraction process where beryllium is extracted from solution with an organic solvent. The barren raffinate solution is discarded as a waste stream.

The beryllium is stripped from the organic phase into an aqueous solution. Iron is precipitated from solution and the iron sludge is discarded. Beryllium is next precipitated from solution as beryllium carbonate which is separated from the liquid phase by filtration. The beryllium carbonate may be sold as a product or further processed to beryllium hydroxide.

The beryllium carbonate filter cake is redissolved in deionized water and beryllium hydroxide is precipitated and separated from the liquid phase by filtration. Beryllium hydroxide may be further processed to make beryllium copper alloy, beryllium oxide, or pure beryllium metal.

When beryl ore is processed, the ore is crushed and melted. The molten material is quenched with cold water to produce a glassy material called frit. The frit is dried, ground and leached with strong sulfuric acid, forming a mixture of beryllium sulfate, aluminum sulfate, and silica. Water is added to the mixture and the silica is separated in a series of countercurrent decantation steps. The resultant silica sludge is discarded. The beryllium solution is further processed by solvent extraction, purification and precipitation in an identical manner as beryllium solution from bertrandite ore.

The oxide is produced by dissolving beryllium hydroxide in water, sulfuric acid, and ammonium sulfide. The resulting beryllium sulfate solution is then filtered to remove impurities. The solution flows to an evaporator followed by a crystallizer where beryllium sulfate crystals are formed. The crystals are separated from the mother liquor and the mother liquor is recycled. The beryllium sulfate is calcined in gas-fired furnaces to beryllium oxide.

Beryllium hydroxide, BeOH<sub>2</sub>, is added to a batch makeup tank along with an ammonium bifluoride solution. The resultant ammonium beryllium fluoride solution is filtered to remove insoluble impurities. The washed filter cake is a bifluoride sludge which is discarded.

The filtered ammonium beryllium fluoride solution is next treated with

ammonium sulfide to precipitate dissolved impurities, particularly iron. The precipitated solids are removed in a filter and the resultant sulfide sludge is discarded.

The ammonium beryllium fluoride solution next flows to a crystallizer where ammonium beryllium fluoride crystals are formed. The solids are separated from the liquid phase and the supernatant is recycled.

The dried ammonium beryllium fluoride,  $(NH_4)_2BeF_4$ , is heated in a furnace to drive off ammonium fluoride  $(NH_4F)$  and produce beryllium fluoride  $(BeF_2)$ .

Beryllium fluoride is reduced to beryllium metal by magnesium in a furnace, resulting in a matrix of beryllium metal and magnesium fluoride (MgF<sub>2</sub>).

The principal sources of wastewater in the primary beryllium subcategory are listed below, along with pollutants typically found in each:

(1) Solvent extraction raffinate from bertrandite ore processing is generated when bertrandite ore is leached with sulfuric acid and beryllium is extracted from the resultant solution with an organic solvent. This stream is characterized by a low pH and the presence of toxic metals.

(2) Solvent extraction raffinate from beryl ore processing is generated when beryl ore is leached with sulfuric acid and beryllium is extracted from the resultant solution with an organic solvent. This wastewater has an acid pH and contains toxic metals.

(3) Beryllium carbonate filtrate results from the precipitation of beryllium carbonate which is separated from the aqueous phase by filtration. This wastewater stream is characterized by the presence of toxic metals.

(4) Beryllium hydroxide filtrate is generated when beryllium carbonate is redissolved in water and beryllium is reprecipitated as beryllium hydroxide. The resultant filtrate stream contains toxic metals.

(5) Calcining furnace wet air pollution control wastewater results from the use of wet scrubbing to control sulfur dioxide emissions from beryllium oxide calcining furnaces. This wastewater is characterized by the presence of toxic metals.

(6) Beryllium hydroxide supernatant from beryllium recovery is generated when beryllium is recovered from waste materials by dissolution in sulfuric acid and precipitation as beryllium hydroxide. The resultant supernatant stream is characterized by the presence of toxic metals.

(7) Process condensates are generated by crystallizers and evaporators used in the production of beryllium metal. These condensate streams are characterized by the presence of fluoride.

(8) Fluoride furnace scrubber wastewater results from the use of wet scrubbers to recover ammonium fluoride from the exhaust gases from the beryllium fluoride furnace. This wastewater contains toxic metals and fluoride.

(9) Chip leaching wastewater is generated when pure beryllium metal in the form of chips is leached with nitric acid and rinsed prior to being vacuum cast. This wastewater stream is characterized by a low pH and the presence of toxic metals.

Primary Boron. The primary boron industry consists of two plants operating in different areas of the United States. One plant is located east of the Mississippi and the other plant is in the west. Boron is produced in the form of the metal powder. Both of the boron plants currently achieve zero discharge.

There are two production processes presently employed in the primary boron industry to manufacture boron metal powder. The first is thermal reduction of a solid boron compound, and the second involves thermal decomposition of a boron gas.

In the thermal reduction process, the raw material is boric oxide (B<sub>2</sub>O<sub>2</sub>), also called boric anhydride. Boric acid is obtained from naturally occurring borate mineral deposits and can be derived by the action of sulfuric acid on borax, a common boron-containing ore. In the thermal reduction process, boric oxide and magnesium metal are placed in a reaction vessel and heated. Magnesium reduces boric oxide to boron metal. The reaction products are cooled, broken out of the reaction vessel, and crushed to a powder. Separation of boron powder from magnesium oxide is accomplished by sulfuric acid leaching. Magnesium oxide dissolves in the acid and insoluble boron powder is filtered from the solution and washed with water prior to drying and packaging.

The second boron production process, thermal decomposition, uses diborane as a raw material. The decomposition process takes advantage of the instability of diborane at high temperatures. As the gas is heated, it decomposes into its elemental constituents. Thus boron metal powder is produced. After decomposition and cooling, the boron metal product is recovered and packaged as a powder.

The principal sources of wastewater in the primary boron subcategory are listed below, along with the pollutants typically found in each: (1) Reduction product acid leachate results from acid leaching to facilitate boron metal separation from the magnesium reduction reaction products. Toxic metals and suspended solids are present in this waste stream.

(2) Boron wash water is generated when boron powder filtered from spent acid is rinsed prior to drying. This waste stream contams treatable levels of suspended solids and toxic metals.

*Primary Cesium and Rubidium*. One plant in the United States produces primary cesium and rubidium. That plant is classified as a zero discharger.

The production processes of primary cesium and rubidium are nearly identical and can be divided into three steps, as described below.

The first step involves digestion of cessum or rubidium ores. Pollucite (Cs) or lepidolite (Rb) ores are digested with strong sulfuric acid to dissolve the metal. The ore gangue is removed by filtration and the metal is crystallized out of the remaining solution by cooling. The spent acid is decanted, and the crystals are rinsed with water.

The metal 1s further purified by redissolution and selective precipitation of impurities. The third step involves reduction to cesium or rubidium metal.

The principal sources of wastewater in the primary cesium and rubidium subcategory are listed below, along with the pollutants typically found in each:

(1) Spent acid and crystallizer runse water from cesium production is generated when water used to wash cesium crystals is combined with spent pollucite ore digestion acid. This stream is characterized by low pH as well as the presence of toxic metals and suspended solids.

(2) Spent acid and crystallizer rinse water from rubidium production is generated when water used to wash rubidium crystals is combined with spent lepidolite ore digestion acid. This stream is characterized by low pH as well as the presence of toxic metals and suspended solids.

Primary and Secondary Germanium and Gallium. Of the five primary and secondary germanium and gallium plants in the United States, one is an indirect discharger and four are zero dischargers. There are no direct dischargers. One plant is located in Pennsylvania, two are in the Oklahoma-Texas region, and two are in the far western part of the country. Germanium and gallium plants are located near sources of raw materials, either zinc ore deposits or major electronics firms. All five plants were built within the last 25 years, with two built within the last three years. The average plant age 1s 12 years.

The processes used at a germanium or gallium production facility depend largely on the raw material used and the final product desired. The four basic germanium and gallium processing steps which an individual plant may utilize are discussed below. Germanium and gallium are produced from both primary and secondary raw materials, however the processing steps are essentially the same.

The first step involves chlorination of the germanium or gallium raw material to produce the tetra- or trichloride, respectively. Chlorination is effected with hydrochloric acid or chlorine gas. Germanium tetrachloride product is a vapor, and is recovered in a condenser. Both germanium tetrachloride and gallium trichloride may be purified by a series of distillation and stripping operations.

The second step involves bydrolysis of germanium tetrachloride to produce germanium dioxide, or gallium trichloride to produce a hydrated gallium compound.

In the third step, germanium dioxide and gallium hydroxide are reduced to metal. Germanium dioxide is reduced to metal powder in a hydrogen furnace, and then is melted and cast as bars. Gallium hydroxide is reduced to metal by dissolution and electrolytic recovery.

The fourth step involves further purification of the germanium and gallium products, to achieve purifies in excess of \$9.9599 percent. Further purification of germanium is effected by a zone refining process, aimed at removing dissolved oxygen from the metal. Gallium is purified using a crystallization process.

Gallium can also be recovered from scrap using a solvent extraction process. In solvent extraction, gallium scrap is dissolved in acid, and then the gallium is extracted into an organic phase, from which pure metal is recovered. The principal sources of wastewater in the germanium and gallium subcategory are listed below, along with the pollutants typically found in each:

(1) Still liquor wastewater results from the excess hydrochloric acid used to chlorinate germanium raw material, and from impurities in the germanium raw material. This wastewater contains toxic metals, low pH, and suspended solids.

(2) Chlorinator wet air pollution control wastewater results from wet scrubbers used to control acid and chlorine fumes generated during the reduction of germanium tetrachloride. Chlorinator wet air pollution control wastewater contains toxic metals, and suspended solids. (3) Germanium hydrolysis filtrate wastewater results from the depleted solution after germanium tetrachloride is reacted with water to produce germanium dioride solids. This wastewater is characterized by toxic metals and suspended solids.

(4) Acid wash and rince water wastewater is produced by the hydrofluoric acid-nitric acid wash, followed by water rinse, of germanium bars prior to zone refining. This wastewater contains germanium, and has a low pH and high fluoride content.

(5) Gallium hydrolysis filtrate wastewater results from the depleted solution after gallium trichlonde is reacted to produce hydrated gallium solids. This wastewater is characterized by toxic metals and suspended solids.

(6) Solvent extraction raffinate wastewater results from the and solution in which gallium scrap 13 dissolved prior to being extracted into an organic phase, from which pure metal is recovered. This wastewater is expected to contain toxic organics, metals, and suspended solids.

Secondary Indium. There is one facility currently producing secondary indium in the United States. This facility is an indirect discharger located in the northeastern United States. Plant operations began approximately 59 years ago.

The principal raw materials used for secondary indium production are scrap indium metal and spent electrolyte solutions from secondary silver refining operations.

Leaching and precipitation are the principal operations in the production of secondary indium. Indium scrap is leached with hydrochloric acid to dissolve the indium and produce an indium-laden solution.

The indium-rich leachate then undergoes a series of precipitation steps to remove impurities. Spent electrolytic solutions from secondary silver refineries may be combined with the leachate at this point. Selected impurities such as lead and tin are precipitated out of the solution. The purified indium solution is then processed to precipitate out the indium. Zinc is added to the indiam-rich solution and indium ions in solution are displaced by the zinc. The indium precipitate, called indium sponge, is then removed and sent to the melting and casting operation.

Electrolytic refining is used to produce high-purity indium (up to 99.9393 percent), and utilizes low purity indium as the raw material.

Successive electrolysis processes which use the pure indium cathode as

the anode result in the production of indium of even higher purity. These process steps are repeated until the desired grade of indium is obtained.

Refined indium from the leaching, precipitation, and electrolytic refining processes as well as pure indium scrap can be melted down and cast into the desired product. All indium melting and casting operations are dry.

The principal sources of wastewater in the secondary indium subcategory are listed below, along with pollutants typically found in each:

(1) Displacement tank effluent is generated when indium sponge is produced by displacing indium ions from solution with zinc. This wastewater is characterized by the presence of toxic metals and suspended solids.

(2) Spent electrolyte wastewater results from discharging contaminated electrolyte solution from electrolytic refining operations. This wastewater is characterized by an acid pH and the presence of toxic metals and suspended solids.

Secondary Mercury. All four of the secondary mercury plants in the United States are zero dischargers. One plant achieves this discharge status by contractor disposal of process wastewater, one by complete recycle. and two plants operate dry processes. Two of the four plants are located near the industrial centers of the Northeast. one is in Illinois, and one in California. All four secondary mercury plants were built after World War II. The average plant age 1s 30 years. EPA data show that plant production ranges from less than 25 tons of mercury per year to 100 tons per year, with mean production approximately 55 tons per year.

The processes used at a secondary mercury production facility depend largely on the raw material used and the purity of final product desired. The three basic secondary mercury processing steps which an individual plant may utilize are discussed below.

The first step involves physically or pyrometallurgically separating mercury from gross impurities in scrap. This step precedes distillation. Electrolyte in mercuric oxide batteries is drained prior to recovering the mercury from the battery. Raw materials such as thermometers, switches, filters, controls, zinc and silver amalgams, and soil samples have mercury separated from gross impurities by roasting in a furnace. This pyrometallurgical separation vaporizes the mercury, which is recovered in a condenser, and leaves the nonvolatile solids remaining in the furnace.

The second step involves purifying mercury by distillation, which is generally accomplished in columns, retorts, stills, or kettles. Distillation typically consists of charging raw, impure mercury into the bottom of a still, and heating the charge to a prescribed temperature. While heating the charge, air may be bubbled through the still to oxidize metallic impurities. When the charge reaches a certain temperature, the mercury begins to vaporize, and the purified mercury is recovered in an overhead, water cooled condensing system. Mercury distillation is run batchwise or continuously.

In the third step, distilled mercury may be further purified using either additional distillation steps, or an acid washing process. Multiple distillation can produce very high purity mercury. Final product can have purity as high as 99.999999 percent. Further purification can also be effected by an acid wash and water rinse method. In this method, a small amount of dilute nitric acid is used to wash the distilled mercury product, and then distilled water is used to wash the residual acid away from the mercury product.

The principal sources of wastewater in the secondary mercury subcategory are listed below, along with the pollutants typically found in each:

(1) Spent battery electrolyte wastewater results from draining spent electrolyte from mercuric oxide batteries prior to recovering mercury by distillation. This wastewater is characterized by toxic metals, suspended solids, and a low pH.

(2) Acid wash and rinse water wastewater is generated by washing distilled mercury with dilute nitric acid and rinsing it with water in order to further purify the mercury product. This wastewater contains toxic metals and suspended solids.

(3) Furnace wet air pollution control wastewater results from controlling air emissions from the furnace used to separate mercury from gross impurities. Particulates and fumes not condensed with the mercury product are scrubbed prior to venting to the atmosphere. The scrubber liquor should contain mercury and other toxic metals, and suspended solids.

Primary Molybdenum and Rhenium. There are 13 plants in the United States which engage in primary molybdenum or rhenium production. Three plants are located in the western United States near copper and molybdenite mining operations. The remaining 10 plants are located east of the Mississippi River with five of them in the northeastern and east central United States. Four of the plants are direct dischargers and the remaining nine plants discharge no process wastewater. There are no indirect dischargers in the primary molybdenum and rhenium subcategory. The average plant age is between 25 and 35 years with a fairly even distribution of ages ranging from eight to 67 years.

Molybdenum is produced primarily as technical grade molybdic oxide which is consumed principally by the steel industry. Approximately 35,000 metric tons of molybdic oxide were produced domestically in 1982 by seven plants with an average plant production rate of 5,000 metric tons per year. Approximately 2,000 metric tons of pure molybdenum metal were produced in the United States in 1982 at six plants with an average plant production of 300 metric tons per year. Less than four metric tons per year of rhenium are produced in the United States. The production of molybdenum products can be divided into four general processes. roasting of molybdenum sulfide concentrates, production of pure molybdic oxide by sublimation, production of ammonium molybdate, and reduction of pure molybdic oxide or ammonium molybdate to produce molybdenum metal powder.

Rhenium is recovered from molybdenum roaster flue gases as crude ammonium perrhenate which can subsequently be purified and reduced to rhenium metal.

The primary source of molybdenum is a molybdenum sulfide (MoS<sub>2</sub>) ore called molybdenite. Most domestic molybdenite is mined and concentrated at two large mines in Colorado and a smaller amount comes from a mine in New Mexico. Molybdenite is also recovered as a by-product from concentrating prophyry copper ores. Rhenium is produced only from molybdenite which is associated with copper mining operations.

Molybdenite concentrates, which are typically 90 percent molybdenum disulfide (MoS<sub>2</sub>), are roasted in multiple hearth furnaces. The product 1s technical grade molybdic oxide consisting of 90 to 95 percent MoO<sub>3</sub>. The flue gases contain products of combustion, sulfur dioxide, and rhenium heptoxide (Re<sub>2</sub>O<sub>7</sub>) when molybdenite concentrates from copper mining operations are roasted. Sulfur dioxide emissions are controlled with either a caustić scrubber or a sulfuric acid plant.

Pure molybdic oxide can be produced from technical grade molybdic oxide through sublimation and condensation. The tech oxide is heated in a muffle type furnace. The oxide is vaporized and carried in a stream of forced air through cooling ducts and the condensed oxide particles are collected in a fabric filter. The purified oxide contains greater than 99.5 percent  $McO_3$ . The pure oxide may be sold as a product, reduced to molybdenum metal powder, or used to produce various molybdenum chemicals.

Technical grade molybdic oxide\_is dissolved in ammonium hydroxide solution and recrystallized as pure ammonium molybdate. Prior to dissolving, the tech oxide is leached with nitric acid and rinsed with water to remove impurities. Alternatively, the molybdenite may be leached prior to roasting. The ammonium molybdate may be sold as a product, calcined to form pure molybdic oxide, or reduced to form molybdenum metal powder.

Either pure molybdic oxide or ammonium molybdate may be reduced in a hydrogen atmosphere to produce molybdenum metal powder.

When molybdenite concentrates from copper mining operations are roasted, rhenium present in the concentrate is volatilized as rhenium heptoxide  $(Re_2O_7)$ . The rhenium heptoxide is water soluble and is removed from the flue gas by wet scrubbing. The rhenium is then recovered from the scrubber liquor via selective 10n exchange or solvent extraction. Rhenium is stripped from the resin or solvent and crude ammonium perrhenate, NH4ReO4, 1s crystallized from the resultant solution. The crude ammonium perrhenate may be sold as a product, further purified prior to reduction to rhenium metal, or used in the manufacture of various rhenium chemicals.

The principal sources of wastewater in the primary molybdenum and rhenium subcategory are listed below, along with the pollutants typically found in each:

(1) Molybdenum sulfide leachate and runse water is generated when molybdenite concentrates are leached with nitric acid and runsed with water prior to roasting. This stream is characterized by low pH as well as the presence of toxic metals and suspended solids.

(2) Roaster wet air pollution control wastewater results from the use of alkaline wet scrubbing systems to control sulfur dioxide emissions from molybdenite roasting operations. This stream is characterized by high alkalinity and the presence of toxic metals and suspended solids.

(3) Hydrogen reduction furnace scrubber wastewater results from scrubbing hydrogen gas with water to cool and quench the gas prior to recycling the hydrogen to the reduction furnace. This wastewater stream is characterized by the presence of toxic metals and suspended solids.

(4) Molybdic oxide leachate wastewater results from the leaching of technical grade molybdic orade with nitric acid, water or animonium hydroxide prior to dissolving, purification and crystallization of ammonium molybdate. This leachate and rinse wastewater is characterized by the presence of toxic metals and ammonia.

(5) Rhenium scrubber solution results from scrubbing rhenium heptoxide from molybdenite roaster off-gases with water and recovering the rhenium from aqueous solution by solvent extraction or ion exchange. This wastewater stream is characterized by the presence of torus metals.

Molybdanum Metallurrucal Acid Plants. Metallurgical acid plants produce sulfuric acid from culfur dioxide air emissions at primary molybdenum facilities. There are 3 metallurgical sulfuric acid plants associated with primary molybdenum plants in the United States. Of these two are direct dischargers, and one achieves zero discharge. One of the direct discharging facilities is in Iowa and the other two facilities are located in Pennsylvania. There are insufficient data to ascertain the age of soid plants independently of the molybdenum plants associated with them. The average production capacity for metallurgical acid plants associated with primary molybdenum operations is 50,000 to 100,000 tons per year of 100 percent sulfuric acid.

Metallurgical acid plants produce sulfuric acid from the sulfur oxide emissions of pyrometallurgical operations. By producing acid, the acid plants not only clean the smelter emissions of many tons per day of sulfur oxides, but they also produce a marketable sulfuric acid product.

Prior to entering the acid plant, the off-gas stream from pyrometallargical operations will usually undergo various pretreatment steps. The pretreatment steps include cooling, cleaning, conditioning (humidification), mist precipitation, drying and compression.

In the acid production section, a vanadium pentoxide catalyst converts the sulfur dioxide in smelter off-gases to sulfur trioxide, and the sulfur trioxide is absorbed into a sulfuric acid stream. The sulfur trioxide combines with water in the absorbing sulfuric acid (which, in effect, increases the strength of the contacting acid stream).

The principal wastewater sources in metallurgical acid plants are as follows:

- -Sintering wet air pollution control,
- -Roasting wet air pollution control,
- Conversion wet air pollution control,
   Acid plant wet air pollution control,

- -Mist precipitator,
- -Box cooler, and
- -Mist eliminator.

These wastewater sources are usually combined into a single wastewater stream—acid plant blowdown—which is treated and then recycled or discharged.

The acid plant blowdown stream contains the toxic metals arsenic, chromium, copper, lead, nickel, selenium, and zinc, and total suspended solids.

Secondary Molybaenum and Vanadium. The one secondary molybdenum and vanadium facility in the United States is a direct discharger. It is located in Southern Texas, and was built in 1973. This industry involves the recovery of molybdenum and vanadium from secondary sources using hydrometallurgical processes.

The basic secondary molybdenum and vanadium processing steps are discussed below.

After some dry preparation steps, the raw material is leached with water to remove impurities and then dissolved, producing a solution containing the molybdenum and variadium, and a tailing waste stream.

Molybdenum and vanadium are separated by precipitating vanadium from solution. Molybdenum does not precipitate, and the filtrate is routed to the molybdenum purification process. The vanadium rich colids are washed to remove traces of molybdenum, and then are manufactured into their final product form. One product form is vanadium pentoxide ( $V_2O_5$ ), produced by decomposing the solids in a furnace.

Finally, molybdenum is precipitated from solution. This produces molybdic acid solids, which are recovered by filtration. Molybdic acid solids are dried and converted to molybdenum trioxide product (MoO<sub>2</sub>) in a furnace.

The principal sources of wastewater in the secondary molybdenum and vanadium subcategory are listed below, along with the pollutants typically found in each:

(1) Leach tailings wastewater results from the water leaching process used to remove inerts and other impurities from the raw material, and is characterized by toxic metals and suspended solids.

(2) Molybdenum filtrate wastewater is generated by the precipitation of molybdenum from a molybdenum-rich liquid produced by the vanadium recovery process. This wastewater is characterized by toxic metals, ammonia, and suspended solids.

(3) Vanadium decomposition wet air pollution control wastewater results from air emicsions control on the furnace used to produce vanadium oxide from vanadium solids. This wastewater contains ammonia, toxic metals, and suspended solids.

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( $\overline{4}$ ) Molybdenum drying wet air pollution control wastewater results from air emissions control on the furnace used to dry molybdic acid and to produce molybdenum trioxide from the molybdic acid. This wastewater contains molybdenum, toxic metals, and suspended solids.

Primary Nickel and Cobalt. The one primary and nickel and cobalt plant in the United States is a direct discharger. It is located in southern Louisiana and was built in 1959.

The processes used at a primary nickel and cobalt production facility depend largely on the raw material used and the final product desired. The three basic primary nickel and cobalt processing steps which an individual plant may utilize are discussed below.

The first step involves crushing and grinding the ore concentrate, which contains copper, nickel, cobalt, and various impurities. Raw material is crushed and ground in a wet ball mill, and then fed to a sulfuric acid leaching system.

The second step involves separating copper from the nickel and cobalt. This is effected by leaching with a sulfuric acid-copper sulfate solution. Nickel and cobalt are leached into solution, while copper remains in the solid phase. The copper-containing solids are routed to the copper recovery system.

In the third step, nickel and cobalt are separated from each other, and each metal 1s purified. Separation 1s accomplished by precipitating cobalt out of solution with an ammonia compound. Nickel powder is recovered from the nickel-rich solution by reduction in a hydrogen autoclave. The excess solution is routed to an ammonium sulfate recovery process. Purification of cobalt is effected by the pentammine method. where nickel and other impurities are removed. Cobalt pentammine is reduced to cobalt powder in a hydrogen autoclave. The excess solution from cobalt purification is also routed to an ammonium sulfate byproduct recovery system.

The principal sources of wastewater in the primary nickel and cobalt subcategory are listed below, along with the pollutants typically found in each:

(1) Raw material dust control wastewater results from slurrying the baghouse dust generated by crushing and grinding ore concentrate in the mill. This wastewater is characterized by toxic metals (mainly copper and nickel), and suspended solids.

(2) Nickel wash water wastewater is generated by washing the nickel powder product produced by hydrogen reduction. This wastewater contains toxic metals and suspended solids.

(3) Nickel reduction decant wastewater is generated by reducing the nickel-rich solution to metal powder in an autoclave. This waste stream is characterized by a neutral pH, several toxic metals, and a high ammonia (as ammonium sulfate) content.

(4) Cobalt reduction decant wastewater is generated by reducing the cobalt-rich solution to metal powder in an autoclave. This waste steam has similar characteristics to the nickel reduction decant waste stream.

Secondary nickel. Of the two secondary nickel plants in the United States, one is an indirect discharger and one is a zero discharger. Both plants are located near the industrial centers of Western Pennsylvania. One plant was built in 1923, and the other plant was built in 1976.

The processes used at a secondary nickel production facility depend largely upon the raw material used and the final product desired. Secondary nickel production processes can be discussed in the context of three sources of raw materials: nickel melt furnace slag, nickel carbonate produced from acidic waste streams and sludges generated during forming operations, and solid scrap. Nickel alloy scrap-generated at steel mills may also be recycled within the mill, however, no refining of the nickel scrap takes place prior to recycle.

The objective of slag reclamation is to recover the nickel values from the dross or slag produced in the nickel melt furnaces of a nickel forming plant. When nickel ingots are melted in the presence of fluxing agents, oxidized metals and impurities rise to the surface of the liquid metal and are removed from the furnace. This slag is approximately 10 percent metallics.

The dross or slag is first cooled and solidifed, and then mechanically granulated with a jaw crusher and a wet rod mill, in order to facilitate nickel separation. It is then fed into a mineral jig, which is a wet operation. The jig uses specific gravity differences to recover the nickel-rich material which is recycled to the nickel melt furnace.

In the acid reclaim process, a vessel filled with soda ash (Na<sub>2</sub>CO<sub>3</sub>) has the spent acids, pickling wastes, and wastewater treatment sludges from nickel forming operations added to it. This pH adjustment step precipitates the nickel out of the dissolved phase into the solid phase. The depleted nickel forming waste solutions are removed by filtration, and the nickel carbonate solids are recovered. The impure nickel carbonate is the raw material for the acid reclaim process.

Impure nickel carbonate is slurried with water to produce a homogeneous solution, and then roasted in an open hearth furnace. Roasting drives off the water, and oxidizes the nickel.

The nickel oxide product from roasting is then leached with water to remove impurities, and filtered. The nickel oxide product is approximately 35 percent nickel, and is returned to the nickel melting furnaces.

Scrap generated by a manufacturing facility may be recycled to recover the nickel values. The scrap is fed into a digestion unit with nitric acid and water. The acid removes silver and other impurities, and a 95 percent nickel product is either sold or returned to the manufacturing facility. The spent solution containing significant silver values is routed to a silver recovery process. There are no waste streams associated with scrap reclaim.

The principal sources of wastewater in the secondary nickel subcategory are listed below, along with the pollutants typically found in each.

(1) *Slag reclaim tailings* wastewater results from the wet operation used to reclaim nickel from melt furnace slags, and contains toxic metals and suspended solids.

(2) Acid reclaim leaching filtrate wastewater results from the water leaching process where nickel oxide, produced by roasting nickel carbonate, is purified by leaching away impurities. Toxic metals and suspended solids are found in this waste stream.

(3) Acid reclaim leaching belt filter backwash wastewater is produced by backwashing the belt filter used to recover purified nickel oxide, and contains toxic metals and suspended solids.

Primary Precious Metals and Mercury. Seven of the eight primary precious metals and mercury plants in the United States are zero dischargers. One primary precious metals plant is a direct discharger. Six of the plants achieve zero discharge via permanent lagooning and reuse of process wastewater, and one plant does not generate process wastewater. All eight plants are located west of the Mississippi River, with four plants in Nevada, one in South Dakota, one in Montana, one in Idaho, and one in Colorado. Seven primary precious metals and mercury plants began operations within the last 20 years, and one plant began operations more than 75 years ago. EPA data show that plant production of gold ranges from less than 10,000 troy ounces per year to 200,000

troy ounces per year, with average production approximately 70,600 troy ounces per year; plant production of silver ranges from less than 10,000 troy ounces per year to more than 500,000 troy ounces per year, with average production approximately 220,000 troy ounces per year. The production of mercury is not presented to protect confidential data supplied to the Agency.

The processes used at a primary precious metals and mercury production facility depend largely on the raw material used and the final product desired. Primary precious metals produced as a by-product of primary copper manufacturing are regulated under nonferrous phase I in the primary copper refining subcategory. In nonferrous phase II, the primary precious metals raw material is not copper-based. The three basic primary precious metals and mercury processing steps which an individual plant may utilize are discussed below.

The first step involves smelting or calcining the ore mining beneficiation product in a furnace. This pyrometallurgical step is used to separate the primary precious metals or mercury from the base metals and waste ore. If there is mercury in the raw material, it is vaporized, and recovered as a product in a condenser. The calcined ore waste product is removed from the furnace. No further purification of mercury is necessary. Gold and silver containing raw materials are smelted in the presence of fluxing agents to produce a gold- and silver-rich doré metal intermediate product. Slag, containing base metals such as zinc, lead, and copper, is skimmed off the smelting furnace. Doré metal may be cast and sold as a product, or it may be refined.

The second step involves separating gold from silver, and this can be done either electrolytically or with a chlorine parting furnace. In the electrolytic method, gold and silver containing Doré metal is cast as an anode, and electrolytically refined using a silver nitrate electrolyte. Silver crystals are recovered on the cathode, and are cast as a product, and gold remains as slimes in the canvas anode bags. Gold slimes are washed with acid and rinsed with water before being cast as a product.

Gold and silver can also be separated in a parting furnace by forcing chlorine gas through molten Dore metal. Silver is converted to silver chloride, which rises to the surface of the melt and is skimmed. The gold product remains in the furnace.

In the third step, gold and silver are further purified using various methods.

Gold can be further purified electrolytically, using a chloride solution. As described above, gold slimes can be further purified using an acid wash and water rise process. Silver chloride can be reduced to silver metal by dissolution and displacement from solution with iron. Silver metal is then melted with a flux and cast as silver product.

The principal sources of wastewater in the primary precious metals and mercury subcategory are listed below, along with the pollutants typically found in each.

(1) Smelter wet air pollution control wastewater results from control of air emissions from the precious metals doré smelter using a wet scrubber. This waste stream is characterized by toxic metals and suspended solids.

(2) Silver chloride reduction spent solution wastewater results from the reduction of silver chloride to silver metal by dissolution and displacement with iron. This wastewater contains toxic metals, chloride, suspended solids, oil and grease, and a low pH.

(3) *Electrolytic cells wet air pollution control* wastewater results from control of air emissions from the electrolytic cells used to further purify gold, which has already been separated from silver, using a wet scrubber. This wastewater has similar characteristics to the smelter scrubber wastewater.

(4) Electrolyte preparation wet air pollution control results from air emissions control on the reaction vessel used to produce silver nitrate electrolyte from pure silver and nitric acid, using a wet scrubber. This wastewater should have characteristics similar to smelter wet air pollution control wastewater.

(5) Silver crystal wash water wastewater results from washing the silver crystals deposited on the cathode in the electrolytic refining of Doré metal. This wastewater should contain toxic metals and suspended solids.

(6) Gold slimes acid wash and rinse water wastewater is generated by the dilute nitric acid wash and water rinse of the gold slimes produced by the electrolysis of Doré metal. This wastewater is expected to contain toxic metals and suspended solids.

(7) Calciner wet air pollution control wastewater results from control of air emissions from the calcining furnace where mercury-containing raw material is roasted. Fumes and particulates passing through the mercury condenser are controlled with a wet scrubber, or series of scrubbers. This wastewater contains high concentrations of mercury, plus some toxic metals and suspended solids. (8) Calcuner quench water wastewater is generated by the water quench used to cool the calcuned ore from the mercury roasting furnace. This wastewater contains toxic metals and suspended solids.

(9) Calciner stack gas cooling water wastewater results from the contact cooling water used to cool the gas emissions from the mercury roasting furnace. This wastewater contains mercury and suspended solids.

(10) *Mercury calcining condensate* wastewater results from the blowdown of water from the condenser where vaporized mercury is collected. This wastewater is characterized by mercury and suspended solids.

(11) Mercury cleaning bath wastewater is generated by the water cleaning bath through which condensed mercury is passed prior to being sold as a product. This wastewater contains mercury, some other toxic metals, and suspended solids.

Secondary Precious Metals. There are 48 plants in the United States that recovery gold, platinum, palladium, indium, rhodium, osmium, or ruthenium from recycled materials. The plants are concentrated in the Northeast and California, with plants also located in Arizona, Florida, Illinois, Ohio, Virginia, Minnesota, and Washington. EPA data show that a small minority (three) of secondary precious metals plants are direct dischargers. Of the remainder, 29 are indirect dischargers, and 16 are zero dischargers. Most of the plants began operating within the last 15 years.

One-third of the 48 secondary precious metals plants that reported data produce less than 10,000 troy ounces of total precious metals per year; all three of the direct dischargers produce in excess of 50,000 troy ounces per year, as well as 10 of the indirect dischargers.

The processes used at a secondary precious metals production facility depend largely upon the raw materials used and the plant's final products. Secondary precious metals production processes can be divided into two stages: raw material preparation and refining steps.

Depending on the raw material being processed, a plant may use one or more raw material preparation steps to prepare the raw material for the refinery. Plants which process dental scrap, optical scrap, electrical scrap, or spent catalysts may use a pyrometallurgical process. These raw materials may be crushed, ground, and incinerated or smelted in a furnace in order to remove the carbonaceous material and volatile fraction. Incineration produces a precious-metal bearing residue which may then be fed directly to the refinery. Smelting usually produces a copper based bullion product which can either be sold or further processed in the refinery.

Gold-containing electrical scrap can be stripped with sodium or potassium cyanide solution. Cyanide stripping works best where gold is exposed on the surface of the scrap. The gold is recovered from the cyanide solution by precipitation as a gold-laden sludge, and the sludge is routed to the refinery.

Gold, rhodium or palladium can be recovered from spent or contaminated electroplater's solutions by either a precipitation or electrolysis process. Precious metals are precipitated as a precious metal-bearing sludge from spent plating solutions using zinc or sodium hydrosulfite, and the sludge is routed to the refinery. Gold is also recovered from spent plating solutions electrolytically, and the electolysis product is routed to the refinery.

Some plants do not use any of the raw material preparation steps described above on their raw materials, and proceed directly with the refining steps. Other plants may only melt and granulate their raw material prior to refining. Granulation is a common practice with jewelry scrap.

Refining steps are taken to produce high-purity precious metals (generally 99.9-99.99 percent) from lower purity raw materials, which may have undergone raw material preparation steps. The hydrometallurgical refining process involves dissolving raw materials in strong acid, such as aqua regia (one part concentrated nitric acid: three or four parts concentrated hydrochloric acid), filtering away silver chloride solids, and precipitating gold with sulfur dioxide or chlorine gas. The filtrate from gold precipitation is the raw material for recovering platinum group metals. Platinum group metals are precipitated out of solution using ammonium chloride, and are selectively dissolved in either acid or base and recovered. These refining processes are often repeated to increase the purity of the final product. Each of the metals produced is washed with water to remove any traces of acid or base.

Other hydrometallurgical refining processes, such as electrolysis or solvent extraction, are also used to recover gold. Electrolysis involves casting the raw material as an anode, and using an acidic electrolyte to recover gold on the cathode.

Solvent extraction involves dissolving raw material in acid, and extracting gold into an organic phase. Gold is recovered from the organic phase as a pure metal,

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and the organic solution is reused. The gold product is washed with water.

After precious metals are refined, they may be further processed in one of three ways. Gold and platinum group metals are cast as bars; gold is granulated to form shot; and gold is reacted with potassium cyanide solution to form potassium gold cyanide (PGC) salt. PGC salt is a raw material used in the electroplating industry. The principal sources of wastewater in the secondary precious metals subcategory are listed below, along with pollutants typically found in each.

(1) Furnace wet air pollution control wastewater results from the scrubbing of incinerator and smelting furnace offgases. This wastewater contains toxic organics, toxic metals, cyanide, and suspended solids.

(2) Raw material granulation wastewater is produced by granulating melted raw material with water in a manner similar to shot casting. The wastewater is characterized by toxic metals and suspended solids.

(3) Spent plating solutions wastewater is a result of recovering gold, palladium or rhodium from spent or contaminated electroplater's solutions, and is characterized by toxic metals, free and complexed cyanide, and suspended solids.

(4) Spent cyanide stripping solution wastewater is produced by stripping gold away from electronic scrap and then recovering the gold from solution. This wastewater consists of free and complexed cyanide, toxic metals, and suspended solids.

(5) Refinery wet air pollution control wastewater is a result of air emissions from basic and acid dissolution and precipitation reactions in the refinery. Pollutants found in this wastewater include toxic organics and metals, cyanide, ammonia, and suspended solids.

(6) Gold solvent extraction raffinate and wash water wastewater is produced by dissolving raw material in acid, and then recovering it by extraction into an organic solvent. After recovering pure gold, the product is washed with water. This wastewater is characterized by toxic organics and metals, and suspended solids.

(7) Gold spent electrolyte wastewater results from the electrolytic recovery of gold from raw material cast as an anode. This wastewater consists of toxic metals and suspended solids.

(8) Gold precipitation and filtration wastewater results from the dissolution of raw material in aqua regia, filtering away silver chloride, precipitating gold, and recovering gold by filtration. The gold product is washed with water, which is included in this effluent. This wastewater is contains toxic metals, ammonia, and suspended solids.

(9) *Platinum precipitation and filtration* wastewater results from dissolution of platinum-bearing raw material, precipitation of platinum, and water wash of the product. This wastewater is contains toxic metals, ammonia, and suspended solids.

(10) Palladium precipitation and filtration wastewater results from the dissolution of palladium bearing raw material, precipitation of palladium, and a water wash of the product. This wastewater contains toxic metals, ammonia, and suspended solids.

(11) Other platinum group metals precipitation and filtration wastewater results from dissolution of platinum group metals (PGM) bearing raw material, precipitation of the PGM, and a water wash of the product. This wastewater contains toxic metals, ammonia, and suspended solids.

(12) Spent solutions from PGC salt manufacturing wastewater is a result of adding excess potassium cyanide solution to pure gold in order to produce PGC salt. The excess, or spent solution contains toxic metals, free and complexed cyanide, and suspended solids.

(13) Equipment and floor wash wastewater results from the need for plants to recover product which would normally be lost in spills and leaks, and is characterized by toxic metals, ammonía, and suspended solids.

Primary Rare Earth Metals. The primary rare earth metals industry consists of four plants; one is located in southwest United States and the remaining three are in the northeast United States. Of these four facilities, two were built in the past 20 years, while two were built nearly 70 years ago. The average production of rare earth metals from these plants is 270 tons per year. One of the plants is a direct discharger, one is an indirect discharger, and two are zero dischargers.

Rare earth metal production can be divided into two types of metals produced: pure rare earth metals, and mischmetal, an alloy of various rare earth metals and iron. The two types of rare earth metals production processing steps which an individual plant may utilize are discussed below.

Pure rare earth metals are produced through reduction processes. Calcium reduction is used for rare earth fluoride raw materials and mischmetal reduction is used for rare earth oxide raw materials. In calcium reduction, the pure metal fluoride is placed with calcium into a reaction vessel in which a heat-driven reaction produces the pure rare earth metal and calcium fluoride slag. The metal is further purified by melting in a vacuum to remove impurities. Final product casting is dependent upon the desired product form.

Rare earth metal oxides are reduced to metal by using mischmetal as a reducing agent. The reduced rare earth metal vaporizes and the vapor is condensed into a crystalline mass. This solid metal product may be crushed into powder or melted and cast.

Mischmetal is produced by electrolysis using rare earth chlorides as raw materials. Rare earth chlorides are often in a hydrated form. Drying furnaces are used to dehydrate the metal chlorides prior to electrolytic reduction. The off-gases from the furnace pass through a continuous spray quench and are then either discharged into the atmosphere or passed through a caustic scrubber. Mischmetal is made by mixing the desired quantities of different dry rare earth chlorides and electrolytically reducing the molten chlorides to metal. The molten mischmetal is collected from the electrolytic cell and cast into ingots.

A principal by-product of electrolytic reduction is a gas containing chlorine. This gas is first quenched to remove particulates and then passed through a caustic scrubber. The reaction between sodium hydroxide and chlorine gas produces sodium hypochlorite which is concentrated by recycling scrubber liquor and sold for industrial use.

The principal sources of wastewater in the primary rare earth metals industry are listed below, along with the pollutants typically found in each:

(1) Dehydration furnace quench and wet air pollution control wastewater results from air pollution control systems on the wet rare earth chloride drying furnaces. This wastewater contains suspended solids and toxic metals.

(2) Electrolytic reduction cell quench wastewater results from cooling gas emissions from electrolytic reduction of rare earth chlorides. This wastewater contains some toxic metals, hexachlorobenzene, and has a low pH.

(3) Electrolytic reduction cell wet air pollution control wastewater is presently used for by-product recovery involving sodium hypochlorite produced from sodium hydroxide and chlorine gas from the electrolytic reduction cell. Because of the recovery operation, no wastewater is discharged.

Secondary Tantalum. There are three plants in the United States that recover

tantalum from secondary sources. The plants are located in the northeastern part of the United States. EPA data show that all of the plants are direct dischargers. The average age of the plants is 60 years; the oldest plant was built in 1900 while the newest plant was constructed just prior to World War II. Secondary tantalum is produced in the form of tantalum metal powder. Average tantalum powder production for the three plants is 12 tons per year.

The processes used at a secondary tantalum production facility depend upon the raw materials used. Secondary tantalum production can be discussed in the context of three raw materials: scrap tantalum alloy metal, electrical components such as capacitors, and tantalum-bearing sludge.

Scrap tantalum alloy metal is material that is generated from forming and stamping operations. This scrap is immersed in acid causing dissolution of all metal components of the alloy except tantalum. When the batch of scrap tantalum has been sufficiently leached of impurties it is filtered from the spent acid and washed with water.

Another significant raw material is scrap electrical components. Of these, capacitors make up the majority. The recovery of tantalum from capacitors is effected by acid leaching. A mixture of acids is poured into a digestor filled with the scrap. The mixture is agitated until the acid becomes spent, at which time it is decanted, and replaced with fresh acid. The procedure is repeated until pure tantalum powder remains. In order to further purify the powder, it is melted by an electron beam refining process to remove impurities. The pure tantalum is solidified and crushed into powder. Finally, it is washed with acid to remove surface oxides. After rinsing with water, the powder is dried and packaged.

Tantalum-bearing sludge is another significant raw material used for tantalum recovery. In addition to upgrading the tantalum content of the sludge, other metals of value are derived through the tantalum recovery process. The procedure involves successive leachings. After washing the leached sludge, it is dried and packaged. The resulting powder contains 25 percent tantalum.

The principal sources of wastewater in the secondary tantalum subcategory are listed below, along with the pollutants typically found in each:

(1) Tantalum alloy leach and rinse wastewater results from leaching tantalum alloy scrap metal, contains dissolved toxic metals such as copper and nickel, suspended solids, and has a low pH. (2) Capacitor leach and ranse wastewater results from leaching of scrap electrical components which are predominantly capacitors. This wastewater has a low pH and contains suspended solids and toxic metals.

(3) Tantalum sludge leach and rinse wastewater results from leaching and rinsing tantalum-bearing sludge during tantalum upgrading operations. It contains toxic metals such as copper and lead, suspended solids, and has a low pH.

(4) Tantalum powder acid wash and rinse wastewater results from final purification of tantalum powder to remove surface oxides. This wastewater contains toxic metals, suspended solids, and has a low pH.

(5) Leaching wet air pollution control wastewater is the scrubber liquor resulting from acid leaching of raw materials for tantalum recovery. This wastewater contains total suspended solids and toxic metals.

Primary and Secondary Tin. There is one plant in the United States which produces primary tin and 11 plants which recover tin from secondary sources such as tin plated steel scrap and tin plating solutions and sludges. Five of the 12 plants which produce primary or secondary tin are located in the west or southwestern United States. Five of the remaining seven plants are located in the east central United States. One plant is located in Indiana and one plant is located Florida. The average plant age is between 16 and 25 years. All of the plants have been built since 1940. The one plant which produces primary tin has a production level between 1,000 and 5,000 metric tons per year. This facility is a direct discharger. Approximately 1,700 metric tons of secondary tin were produced in 1982 at 11 plants with an average plant production of approximately 150 metric tons per year. Seven of the 11 secondary tin plants achieve zero discharge; two are direct dischargers and two discharge to POTW.

Primary tin is produced by smelting tin concentrates with limestone and coke. The crude tin is then electrolytically refined and cast. Secondary tin may also be produced by smelting tin residues, particularly detinners mud from alkaline detinning operations. Most secondary tin, however, is produced by dissolving tin from tin plated steel scrap, and recovering the tin by electrovinning. Tin may also be recovered from solution by precipitation of tin as tin hydroxide. A smaller amount of secondary tin is recovered from tin plating sludges which are generated by tin plated steel production operations.

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Secondary tin production can be divided into four major operations: alkaline detinning, electrowinning, tin hydroxide precipitation, and reduction to tin metal.

The principal raw material for the secondary tin industry is tin plated steel scrap. Virtually all of this scrap comes from fabrication-plants which produce cans and a variety of other tin plated steel products. Such scrap may include punched sheets, rolls and bundles. One producer also reported tin recovery from tin plated steel separated from municipal solid waste. Two producers reported that they recovered tin from spent tin electroplating solutions and plating sludges.

Primary tin is produced by smelting tin concentrates and residues in a reverberatory furnace. Sulfur dioxide emissions from the smelting furnace are controlled with a caustic scrubber. Crude molten tin is removed from the furnace, fire refined and cast into anodes. The anodes are consumed in an electrolytic refining process and the purified tin is cast into ingots.

The first step in recovering secondary tin from tin plated scrap is hot alkaline detinning. Tin plated scrap is loaded into perforated steel detinning baskets and placed in a detinning tank which contains a solution of sodium hydroxide and sodium nitrate. The solution is heated to near the boiling point and the tin dissolves into solution as sodium stannate.

Scrap containing aluminum is pretreated in a solution of sodium hydroxide, in which the aluminum dissolves. After rinsing, the dealuminized scrap is sent to the detinning tanks.

There are two variations of the alkaline detinning process: the saturated process and the unsaturated process. In the saturated process, the sodium stannate solution is allowed to become supersaturated and sodium stannate crystals precipitate from solution. The sodium stannate is recovered from the solution in a filter press and the solution is returned to the detinning tanks. The sodium stannate filter cake may then be sold as a product or redissolved in water for further processing or electrowinning.

In the unsaturated process, the sodium stannate concentration in the solution is kept below the saturation point and the solution is pumped directly to further processing or electrowinning. In both the saturated and the unsaturated process, the sodium stannate solution is purified by adding sodium sulfide or sodium hydrosulfide to precipitate lead and other metal impurities as insoluble metal sulfides.

The precipitated residue is called tin mud or detinners mud and is sold to smelters. Detinners mud may also include residues removed from the bottoms of detinning tanks. This mud contains three to five percent tin and is sold as a by-product to smelters. The tin mud is usually rinsed to recover any soluble tin which may be present. The rinse water is recycled to the detinning tanks. One producer reported an acid neutralization step in which acid is added to the mud. The neutralized mud is then dewatered in a filter press and sold to smelters.

When the detinning cycle is complete, the detinned steel is removed from the detinning tanks. The steel is then rinsed to recover any tin solution which may be adhering to it, pressed or baled, and sold as a product. The rinse water is recycled to the detinning tanks to recover tin.

The purified sodium stannate solution is sent to electrolytic cells where pure tin metal is deposited onto cathodes. The tin is then removed from the cathodes, melted and cast. The electrowinning solution is then recycled to the detinning tanks. A blowdown stream must periodically be discharged from the electrowinning circuit in order to control the concentration of aluminum, carbonates, and other impurities in the solution.

Ône producer reported the use of tin hydroxide as a raw material for electrowinning of tin metal. The tin hydroxide is first washed with water and then dissolved in a solution of sodium hydroxide. The resultant sodium stannate solution is then purified and added to the sodium stannate solution from alkaline detinning and the combined solution enters the electrowinning tanks.

As an alternative to recovering tin metal by electrowinning, tin can be recovered from solution as tin hydroxide. One plant which uses this process precipitates tin from a solution which is a mixture of alkaline detinning solution and a solution generated by dissolving tin plating sludge solids in water. The other plant which precipitates tin hydroxide uses spent tin electroplating solution as a raw material.

The tin hydroxide is dried and calcined in a furnace to produce tin dioxide. The tin dioxide is then charged to a reduction furnace with carbon where it is reduced to tin metal.

The primary sources of wastewater in the primary and secondary tin subcategory are listed below along with the pollutants typically found in each. (1) *Tin smelter wet air pollution coantrol* wastewater results from the use of wet scrubbing systems to control sulfur dioxide emissions from tin smelting operations. This wastewater is characterized by the-presence of toxic metals and suspended solids.

(2) Dealuminizing rinse wastewater results from dissolving aluminum from municipal solid waste derived scrap prior to alkaline detinning. This stream is characterized by an alkaline pH and the presence of cyanide, toxic metals, aluminum, and suspended solids.

(3) *Tin hydroxide wash* wastewater is generated when tin hydroxide is used as a raw material in the electrowinning operations and is washed with water to remove impurities prior to dissolving and electrowinning. This waste stream contains toxic metals and suspended solids.

(4) *Tin mud acıd neutalization filtrate* ıs generated when tin mud is upgraded by acıd addition and dewatering prior to sale to tin smelters. This wastewater contains cyanide and toxic metals.

(5) Spent electrowinning solution from new scrap results from discharging water from the electrowinning circuit to control the buildup of impurities when new tin plated steel scrap is processed. This stream has a very alkaline pH and contains cyanide, toxic metals and suspended solids.

(6) Spent electrowinning from municipal solid waste is required to account for the larger volume of spent electrowinning solution which must be discharged when municipal solid waste is used as a raw material in alkaline detiming and electrowinning. This extra discharge is necessitated by impurities which are introduced into the electrowinning solution by the municipal solid waste. This wastewater is characterized by an alkaline pH and the presence of cyanide, toxic metals and suspended solids.

(7) *Tin hydroxide supernatant from scrap* is generated when tin hydroxide is precipitated from alkaline detinning solution and separated from the aqueous phase by gravity separation. This wastewater contains toxic metals, cyanide, and suspended solids.

(8) Tin hydroxide supernatant from spent plating solutions is generated when tin hydroxide is precipitated from spent tin electroplating solutions and separated from the aqueous phase by gravity separation. This wastewater is characterized by the presence of toxic metals, cyanide, suspended solids, and high concentrations of fluoride.

(9) *Tin hydroxide supernatant from sludge solids* results when tin hydroxide is precipitated from a solution generated

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by dissolving tin plating sludge solids in water. The resultant supernatant stream is characterized by the presence of toxic metals, cyanide, fluoride and suspended solids.

(10) *Tin hydroxide filtrate* results from dewatering tin hydroxide slurry in a filter press. The resultant filtrate stream contains toxic metals, cyanide, fluoride, and suspended solids.

Primary and Secondary Titanium. Of the eight primary and secondary titanium plants in the United States, four are direct dischargers, two are mdirect dischargers, and two are zero dischargers. The plants are located mostly in the eastern and northwestern states. Three plants were built around 1940, three were built between 1956 and 1958, and two have been built since 1975. EPA data show that five of the eight plants produce less than 500 kkg per year while, of the remaining three plants, two produce more than 5,000 kkg per year.

The processes used at a primary and secondary fitanium production facility depend largely on the raw material used and the final product desired. The four basic primary and secondary titanium processing steps which an individual plant may utilize are discussed below.

The first step involves chlorination of rutile or ilmenite ore in a fluidized bed reactor. The resulting titanium tetrachloride is condensed from the reaction gas and purified by distillation.

The second step involves reduction by one of three methods to produce titanum metal sponge. Four plants use the Kroll process in which titanium tetrachloride (TiGL) is added to magnesium in a reduction furnace where it is converted to titanium metal and magnesium chloride. Molten magnesium chloride is tapped off as it is formed and recovered electrolytically. One plant uses the Hunter process to reduce titanum tetrachloride to the metal by sodium in an inert atmosphere. One plant reports the production of titanum sponge by reducing rutile ore in a hydrogren atmosphere without forming the chlorinated intermediate.

Titanum metal sponge is crushed and purified by leaching or by vaccum distillation. The purified metal may be sold as titanium sponge, crushed and sold as titanium powder, or further processed by alloying and casting.

Titanium is also recovered from secondary sources, particularly scrap titanium metal which is washed with acid prior to being melted and cast along with titanium from primary sources.

The principal sources of wastewater in the primary and secondary titanium subcategory are listed below, along with the pollutants typically found in each:

(1) Chlorination off-gas wet air pollution control wastewater results from wet scrubbers on the fluidized bed reactors used to convert rutile ore to the titanium tetrachloride. This wasto stream may contain chlorine, suspended solids, and toxic metals.

(2) Chlorination area vent wet air pollution control wastewater results from wet scrubbers used to control fumes from the ore chlorination operation. This waste stream contains chlorine, suspended solids, and toxic metals.

(3) *TiCl*<sub>d</sub> handling wet air pollution control wastewater results from wet scrubbers used to control fumes from the handling and storage of titanium tetrachlonde. The characteristics of this stream are similar to those of the reduction area scrubber water, which contains suspended solids and toxic metals.

(4) Reduction area wet air pollution control wastewater resulting from wet scrubbers used to control fumes generated from the reduction furnece when titanium tetrachloride is reduced to the metal sponge by magnesium. No wet air pollution control is reported to be associated with reduction by sodium or CaH<sub>2</sub>. This wastewater is characterized by the presence of magnesium, chloride, and toxic metals.

(5) Melt cell wet air pollution control wastewater results from wet scrubbers used to control fumes from molten magnesium chloride which is stored in a melt cell prior to electrolytic recovery. This stream is characterized by low pH and low concentrations of toxic metals.

(6) Cathode gas wet air pollution control wastewater results from air pollution control devices on the electrolytic cells used for magnesium recovery. This waste stream is similar to the wastewater from the melt cell scrubber, which contains low concentrations of toxic metals.

(7) Chlorine liquefaction wet air pollution control wastewater results from wet scribbers used to control vapors which escape during the liquefaction of the chlorine gas generated by the electrolytic recovery of magnesium. This stream is characterized by a low pH and the presence of toxic metals.

(8) Sodium reduction container reconditioning wash water is generated when water is used to rinse the containers used for the reduction of titanium tetrachloride by sodium. This stream contains chlorides, suspended solids, and toxic metals.

(9) Chip crushing wet air pollution control wastewater results from wet scrubbers used to control dust when titanium sponge chips are crushed prior to purification. This stream contains titanium and suspended solids.

(10) Acid leachate and rinse water is generated when titanium sponge is purified by leaching. Purification by vaccum distillation does not generate a wastewater. This waste stream is charactenzed by the presence of suspended solido and toxic metals.

(11) Spange crushing and screening wet air pollution control waterwater results from wet scrubbers used to control dust from the crushing, screening, and storage of leached titanium. This waste stream contains suspended solids and toxic metals.

(12) Acid pickle and wash water is generated when large surface area titanium scrap is pickled and rinsed before alloying and casting. This low pH waste stream contains fluoride and toxic metals.

(13) Scrap milling wet air pollation control wastewater results from wet scrubbers used to control dust from the milling of titanium scrap and turnings. This waste stream contains suspended solids and toxic metals.

(14) Scrop detergent wash water is generated when scrap titanium is washed to remove oil and dirt before alloying and casting. This waste stream contains suspended solids, oil and grease, and toxic metals.

(15) Casting crucible wash water is generated when water is used to clean the crucibles used in casting operations. This stream is similar to casting contact cooling water and should contain oil and grease and toxic metals.

(16) Casting contact cooling water is generated during the casting operations. This stream is characterized by the presence of oil and grease; suspended solids, and toxic metals.

Secondary Tunzsten and Cobalt. Of the five secondary tungsten and cobalt plants in the United States, four are direct dischargers, and one is a zero discharger. All five plants are located m the northeastern part of the country, near industrial centers, and all are in areas of net precipitation. One secondary tungsten and cobalt plant was built prior to World War I, two were built during World War II, and two plants were built in the last 20 years. EPA data show that average plant production of tungsten products is about 100 tons per year. Average plant production of cobalt products is also about 100 tons per year.

The processes used at a secondary tungsten and cobalt production facility depend largely on the raw material used and the final product desired. The basic hydrometallurgical processing steps which an individual plant may use to recover tungsten, tungsten carbide, cobalt, and synthetic scheelite (CaWO<sub>4</sub>) are discussed below.

The major hydrometallurgical processing step used to recover tungsten and tungsten carbide from scrap is to leach impurities such as cobalt, copper, nickel, silver, and zinc away from the product. Leaching usually occurs in an agitated reaction vessel with an acid solution. Tungsten, which is relatively insoluble in acid, is separated from the liquid phase by either filtration or decantation.

Prior to leaching, both tungsten and tungsten carbide scrap may be washed with detergent and rinsed with water. Washing removes surface oils and grease from the scrap in order to facilitate the leaching process.

After leaching, both tungsten and tungsten carbide powder may be washed with dilute acid or base, and rinsed with water. This wash step neutralizes and removes any residual leaching acid or impurities from the tungsten product.

Cobalt is recoverd as a by-product of tungsten carbide via a hydrometallurgical process. Cobalt is used as a binder alloy in tungsten carbide manufacturing and is recovered from tungsten carbide leaching acid.

Both tungsten and tungsten carbide scrap may be used to produce synthetic scheelite instead of pure tungsten or tungsten carbide powder. Synthetic scheelite (CaWO<sub>4</sub>) is used in a primary tungsten refinery as a supplemental feed material to natural scheelite ore.

Pure tungsten scrap is smelted or roasted in a furnace to produce tungsten oxide (WO<sub>3</sub>). Tungsten oxide is dissolved with caustic solution. After filtering away impurities, calcium chloride is added to the solution, and synthetic scheelite is produced. Synthetic scheelite is recovered by filtration.

The principal sources of wastewater in the secondary tungsten and cobalt subcategory are listed below, along with the pollutants typically found in each.

(1) Tungsten detergent wash and rinse wastewater is a result of washing oil and grease off the surface of tungsten scrap prior to leaching, and this stream contains toxic metals, oil and grease, and suspended solids.

(2) *Tungsten leaching acid* wastewater is generated when tungsten scrap is-leached with an acid solution in order to remove impurities from the scrap. This stream is characterized by toxic metals, suspended solids, and a low pH. (3) Tungsten post-leaching wash and rinse wastewater is a result of washing residual leaching acid and impurities away from the tungsten powder product. This stream consists of toxic metals and suspended solids.

(4) Synthetic scheelite filtrate wastewater is produced by the dissolution process where tungsten oxide produced from scrap is converted to synthetic scheelite. This waste stream is charcterized by toxic metals and suspended solids.

(5) Tungsten carbide leaching wet air pollution control wastewater results from the wet scrubbers used to control acid fumes generated during tungsten carbide leaching. This scrubber liquor contains toxic metals, ammonia and suspended solids.

(6) Tungsten carbide wash water is generated when tungsten carbide powder is washed with dilute acid and rinsed with water in order to remove residual leaching acid and impurities. This waste stream is similar to tungsten post-leaching wash and rinse wastewater, and has similar characteristics.

(7) Cobalt sludge leaching wet air pollution control wastewater results from the wet scrubber used to control acid fumes generated during cobalt sludge leaching. This waste stream and tungsten carbide leaching wet air pollution control should have similar characteristics.

(8) Crystallization decant wastewater is produced by plants which recover cobalt from tungsten carbide leaching acid by crystallization. This waste stream is characterized by toxic metals and suspended solids.

(9) Acid wash decant wastewater results from the purification steps used on the cobalt crystals, and contains toxic metals and suspended solids.

(10) Cobalt hydroxide filtrate wastewater is generated by the alkaline dissolution and precipitation process used to produce cobalt hydroxide. This waste stream is characterized by toxic metals and suspended solids.

(11) Cobalt hydroxide filter cake wash water is produced by washing the cobalt hydroxide filter cake with water in order to remove any traces of caustic or other impurities. This waste stream contains toxic metals.

Secondary Uranium. There are three plants in the United States that produce secondary uranium metal. Of these three, two plants are zero dischargers and the third is a direct discharger. The plants are all located east of the Mississippi River. Two plants were built in the 1950s when the uranium industry first began large scale production. The third plant was built nearly 15 years ago to supplement the growing need for uranium for commercial projects.

The uranium production process can be divided into two phases. The first phase is processing uranium scrap materials into uranium tetrafluoride (UF4). The second phase is reduction of uranium tetrafluoride to uranium metal.

Raw materials available to uranium producers include scrap from forming operations, material that does not meet specifications for quality or purity, tailings from machining operations, and residuals present in magnesium fluoride slag from the final uranium tetrafluoride reduction processes.

The initial step in processing uranium from secondary sources is acid leaching. Uranium dissolves in nitric acid to form a nitrate compound, uranyl nitrate (UO<sub>2</sub>(NO<sub>3</sub>)<sub>2</sub>). Recovery of uranyl nitrate from the spent acid is accomplished by addition of ammonia which precipitates ammonium diuranate. The solid is filtered and the filtrate discharged. After redissolving the precipitate in acid, the uranyl nitrate is purified by extraction into an organic solvent, leaving the impurities in the aqueous phase to be discharged. Reextraction into an aqueous phase is followed by evaporation to form concentrated uranyl nitrate. Calcination of the concentrate produces uranium trioxide (UO<sub>3</sub>). The nitrates driven off in calcination combine with hydrogen in the air to produce nitric acid gases which are scrubbed and recycled to the acid leaching operations.

The next process step reduces uranium trioxide to uranium dioxide (UO2). Ammonia is used to supply hydrogen for the reduction. The reaction gases are passed through a KOH scrubber to neutralize any acidity. The final step in preparation of uranium tetrafluoride is hydrofluorination of uranium dioxide. Hot hydrofluoric acid vapors are contacted with uranium dioxide. The ensuing reaction produces uranium tetrafluoride which is used for reduction to uranium metal. Unreacted gases are water scrubbed to collect residual hydrofluoric acid. The scrubber liquor is recycled to concentrate its acid content, and when a desired concentration is achieved, the solution is drawn off and sold for industrial use.

Magnesium reduction is the process converting uranium tetrafluoride to uranium metal. Magnesium metal and uranium tetrafluoride are laced in a bomb reduction vessel where at elevated temperatures the reduction reaction occurs. After cooling, the products are broken out and separated. The uranium metal product is remelted and cast into forms suitable for forming operations.

The principal sources of wastewater in the secondary uranium subcategory are listed below, along with the pollutants typically found in each:

(1) *Refinery filtrate* wastewater results from the digestion of uranum scrap with nitric acid, and contains toxic metals and suspended solids.

(2) Slag leach slurry wastewater is generated by nitric acid digestion of recycled magnesium fluoride slag. The waste stream contains suspended solids and has a low pH.

(3) Solvent extraction raffinate wastewater results from purification of an intermediate uranium compound by extraction into an organic phase. The discharged aqueous solution contains organics and metals, and suspended solids.

(4) Digestion operation wet air pollution control wastewater results from wet scrubbers which control the process emissions from acid leaching. The waste stream contains suspended solids and toxic metals.

(5) Evaporation and calcination wet air pollution control produces no wastewater discharge. Scrubber liquors resulting from control of emissions in the evaporation and calcination operations were reported to be 100 percent reused in the digestion operation.

(6) Hydrogen reduction and hydrofluorination KOH wet air pollution control wastewater results from wet scrubbers that control acid fumes from the hydrogen reduction and hydrofluorination operations. The wastewater contains suspended solids and has an acidic pH.

(7) Hydrofluorination wet air pollution control produces no wastewater discharge. Scrubber liquor that absorbs unreacted hydrofluoric acid gases is recycled to concentrate the acid content. The acid scrubber liquor is drawn off and sold for its hydrofluoric acid content.

Primary Zirconium and Hafnium. Of the three primary zirconium and hafnium plants in the United States, one is a direct discharger, one is an indirect discharger, and one is a zero discharger. The plants are located in the states of Massachusetts, Utah, and Washington. Plant age covers a 42 year span, the oldest plant having been built in 1937

The processes used at a primary zirconium and hafmum production facility depends largely on the raw material used. The five basic processing steps which an individual plant may utilize are discussed below.

The first step involves chlorination of zircon sand to form zirconium-hafnium

tetrachloride. The sand may require drying prior to chlorination to remove excess moisture. The crude tetrachloride is recovered and scparated from silicon tetrachloride (SiCl<sub>4</sub>) impurities by fractional distillation. It is then dissolved in water and filtered to remove suspended solids.

The second step involves the separation of zirconium from hafmum. Several liquid-liquid extraction operations are used to separate the zirconium and hafmum while removing iron impurities. The separated zirconium and hafmum are precipitated as their hydroxides and dewatered by filtration or drying. From this point in the process, zirconium and hafmum are processed separately but identically.

In the third step, the zirconium or hafnium filter cakes are calcined to produce zirconium oxide or hafnium oxide.

The fourth step involves pure chlorination to convert the zirconium or hafnium oxides to the tetrachloride. This process is essentially the same as the first step, sand chlorination.

The fifth step involves reduction of the tetrachloride to their respective metals. The tetrachloride is reacted with magnesium in a retort furnace where it is converted to zirconium or hafnium metal and magnesium chloride. When zirconium oxide is used as a raw material instead of the tetrachloride, it is mixed with magnesium powder and retorted to produce zirconium metal sponge and magnesium oxide. Zirconium oxide can also be used to produce zirconium-nickel alloys. In that reduction process, nickel is added directly to the zirconium oxide, and the mixture is reduced by calcium in a hydrogen atmosphere.

The principal sources of wastewater in the primary zirconium and hafnium subcategory are listed below, along with the pollutants typically found in each:

(1) Sand drying wet air pollution control wastewater results from wet scrubbers used in the zircon sand drying operation. This stream is characterized by the presence of suspended solids and toxic metals.

(2) Sand chlorination off-gas wet air pollution control wastewater results from wet scrubbers used to control offgases from the chlorinators. This wastewater is characterized by the presence of solids and chlorine.

(3) Sand chlorination area-vent wet air pollution control wastewater results from wet scrubbers used to control fumes in the sand chlorination area. This wastewater is characterized by the presence of solids and chlorine.

(4) SiCl<sub>\*</sub> purification wet air pollution control wastewater is generated when wet scrubbers are used to control fumes from the purification of the silicon tetrachloride formed during sand chlorination. This stream contains suspended solids and cyanide.

(5) SiCl<sub>4</sub> purification waste acid results from the purification of silicon tetrachloride formed during sand chlorination. This stream may contain solids and toxic metals.

(6) Faad makeup wet air pollation control wastewater results from wet scrubbers used to control fumes generated when crude zircomumhafnium tetrachloride is dissolved in water and filtered to remove solids. This stream is characterized by the presence of suspended solids and cyanide.

(7) Iron extraction steam stripper bottoms are generated during the steam stripping process which removes iron from hafnium, following the liquid-liquid extraction process which separates zirconium from hafnium. This waste stream contains ammonia, solids, and toxic metals.

(8) Zirconium filtrate wastewater results from the precipitation and filtration of zirconium hydroxide during the separation process. This waste stream contains cyanide, MIEK, solids, and toxic metals.

(9) *Hafnum filtrate* wastewater results from the precipitation and filtration of hafnum hydroxide during the separation process. This waste stream contains suspended solids and cyanide.

(10) Calcining caustic wet air pollution control wastewater results from wet scrubbers on the zirconium and hafnium calcining kilns. This stream is characterized by the presence of sodium sulfite.

(11) Pure chlorination wet air pollution control wastewater results from wet scrubbers used to control fumes from the chlorination of calcined zirconium oxide or hafnium oxide. This waste stream is similar to the sand chlorination off-gas scrubber wastewater and contains solids and chlorine.

(12) Reduction area-vent wet air pollution control wastewater results from water scrubbers on the reduction furnaces used for the magnesium reduction of zirconium and hafmum tetrachlorides. This stream contains solids and metals.

(13) Magnesium recovery area wet air pollution control wastewater results from wet scrubbers used to control fumes from the recovery of magnesium for the reduction process. This stream is characterized by low pH and the presence of magnesium and solids. (14) Zirconium chip crushing wet air pollution control wastewater is generated by wet scrubbers used for dust control when zirconium metal sponge is chipped out of the reduction container and crushed prior to purification. This stream contains solids and metals.

(15) Acid leachate wastewater is generated when remaining impurities are removed from crushed zirconium metal sponge or zirconium alloy by leaching with hydrochloric or acetic acid. This stream is characterized by low pH and the presence of solids and toxic metals.

(16) Leaching rinse wastewater is generated when water is used to rinse leached zirconium sponge or zirconium alloy. This waste stream is characterized by low pH and the presence of solids and toxic metals.

## III. Scope of This Rulemaking and Summary of Methodology

This proposed regulation is a part of a new chapter in water pollution control requirements. The 1973–1976 round of rulemaking emphasized the achievement of best practicable technology (BPT) by July 1, 1977 In general, this technology level represented the average of the best existing performances of well-known technologies for control of familiar (or "classical") pollutants.

In this round of rulemakings EPA is emphasizing the achievement of the best available technology economically achievable (BAT), which will result in reasonable further progress toward the national goal of eliminating the discharge of all pollutants. In general, this technology level represents the very best economically achievable performance in any industrial category or subcategory. Moreover, as a result of the Clean Water Act of 1977, the emphasis of EPA's program has shifted from "classical" pollutants to the control of a lengthy list of toxic substances.

In developing this regulation, EPA studied the nonferrous metals manufacturing category to determine whether differences in raw materials, final products, manufacturing processes, equipment age and size of plants, water use. wastewater constitutents. or other factors required the development of separate effluent limitations and standards for different segments (or subcategories) of the industry. This study included the identification of raw waste and treated effluent characteristics, including: the sources and volumes of water used, the processes employed, and the sources of pollutants and wastewaters. Sampling and analysis of specific waste streams enabled EPA to determine the presence

and concentration of toxic pollutants in wastewater discharges.

EPA also identified both actual and potential control and treatment technologies (including both in-process and end-of-process technologies). The Agency analyzed both historical and newly generated data on the performance, operational limitations, and reliability of these technologies. In addition, EPA considered the impacts of these technologies on air quality, solid waste generation, water scarcity, and energy requirements.

The Agency then estimated the costs of each control and treatment technology using a cost model developed by standard engineering analyses. EPA derived unit process costs for 70 discharging plants (plus one plant that does not discharge but has stated an intention to discharge but has stated an intention to discharge in the future) using data and characteristics (production and flow) applied to each treatment process (*e.g.*, chemical precipitation, sedimentation, granular bed—multi-media filtration, etc.). These unit process costs were added to yield the total cost at each treatment level.

As one means of evaluating each technology option, the Agency developed estimates of the pollutant removals and the compliance costs associated with each option. Our methodologies are described below.

A. Pollutant Removal Estimates. In calculating pollutant removal estimates, we developed estimates for pollutant loadings in raw wastewater (by subcategory), for the mass of pollutants that would be discharged at each technology option, and for the mass of pollutants discharged currently.

Calculation of raw waste values varied depending upon whether the Agency was able to sample wastewater from unit operations within the subcategory. Where we sampled a unit operation (or sampled the same unit operation at different plants) and were able to obtain both analytical concentration data (mg/l) and production normalized flow values (liters of flow/kkg of production), we computed the mass loading associated with the unit operation (expressed in mg/kkg, *i.e.*, pollutant concentration x production normalized flow), and took the means of these mass loadings at every plant sampled.

After deriving this mean, we multiplied it by the subcategory-wide production associated with that unit operation at each plant (the production data is part of each plant's response to the data collection portfolio (dcp)—see Section IV below). The total represents estimated raw waste values for the subcategory from the unit operation. Summing raw waste values from each unit operation in the subcategory gives the total for the subcategory.

If we sampled a unit operation and were able to determine analytical concentrations of pollutants, but were unable to determine flow, we used production normalized flow data from the dcp's to compute mass loadings and otherwise followed the same procedure.

If we were unable to sample a unit operation at any plant, we computed raw waste values by making an engineering judgment as to which sampled unit operations had wastewater of similar quality. We then took these analytical values and computed a mass limitation using production normalized flow information from the dcp's. These mass limitations then were summed to give total subcategory raw waste values for that unit operation.

In determining mass loadings associated with each technology option, our general procedure is to take the achieveable concentrations associated with the option (mg/l) and compute mass loadings using either the production normalized flow associated with that option (for example, BAT regulatory flow), or the actual flow, whichever is smaller, on a plant-byplant basis. This mass (mg/kkg of each plant's production) is then multiplied by the production for each plant in the subcategory (from dcp's, as before), which are then summed to give total mass discharged.

We used similar methods to estimate current discharge. We first identified from dcp responses what treatment is in place at each discharging facility. We then determined whether the treatment technology was being operated in a manner that would result in the pollutant mass discharge level considered achievable at each plant with the technolgy they have in place. Based on this determination, the current pollutant mass discharge at each facility was set equal to either the raw waste generated by the plant or to the mass discharge considered achievable by the treatment technology in place. The mass discharges for each facility were then summed to attain the total current discharge for a subcategory.

B. Compliance Costs. In estimating subcategory-wide compliance costs our first step was to develop a uniformlyapplicable cost model, relating total plant costs associated with installation and operation of wastewater treatment technologies to production and flow data specific to each plant. Section VIII of the General Development Document provides additional discussion of our cost estimates.

The first step in developing our cost estimates is to perform material balances (pollutant loadings) for the plant's wastewater treatment processes. These material balances are used to determine the type and size of the treatment system needed. The resulting equipment and process selections are then used to calculate investment as well as operation and maintenance (O&M) costs for each component in the treatment system. We then add 37.5 percent system capital costs for engineering, contingency, and contractor's fees to arrive at the total investment cost. Annual costs for the plant to comply with this regulation are determined as the sum of the O&M costs, monitoring costs, taxes, and amortized investment cost. The cost model data base used relies heavily on actual practice reported in this category and on equipment vendor quotes.

Our estimates include capital costs for only those processes that a plant has not yet installed; the annual costs (without depreciation or interest) for each process are included regardless of whether or not this process has been installed. We believe this is a very conservative assumption since most plants have installed treatment to meet NPDES or other requirements rather than in anticipation of this regulation.

The second step is the calculation of flow to the treatment system. For each regulatory option and wastewater source, the Agency has established a flow allowance. The actual wastewater flow (reported in plant dcps) from each production operation is compared to the corresponding regulatory flow for that operation and the lower of the two is selected as the basis for cost estimation (i.e., treatment equipment size, amount of treatment chemicals needed, etc.). This procedure eliminates the overestimation of end-of-pipe treatment system costs for plants that are currently below the regulatory flow allowances. For plants with flows currently above the regulatory flow allowances, costs for installation and operation of equipment necessary to achieve flow reductions to the regulatory flow are included.

Third, several cost and design assumptions are inherent in the computations. Among the most significant of these are the following:

The dollar base is March of 1982;
 Twenty percent excess capacity is

included in cost estimations;

(3) Unless otherwise specified, all wastewater treatment sludges are considered to be nonhazardous;

(4) Costs for segregation of wastewaters not included in this regulation (e.g., noncontact cooling water) or for routing regulated waste streams not currently treated to the treatment system are estimated on the basis of purchase and installation of 500 feet of four-inch piping (with valves, pipe racks, and elbows) for each stream. Storm water is segregated by including costs for installation of 300 feet of twofoot diameter underground concrete pipe to route storm water around the treatment system;

(5) Monitoring costs are calculated using a frequency that is a function of flow for each plant and a sampling and analysis cost of \$120 per sample;

(6) Where a plant has wastewater sources from two nonferrous phase II subcategories (e.g., secondary tantalum and secondary tungsten and cobalt plant wastewater), the costs are normally apportioned between subcategories on a flow-weighted basis, since hydraulic flow is the primary determinant for equipment size and cost. At a specific plant, however, no incremental costs are incurred by a subcategory for flow reduction, if the waste streams associated with that subcategory do not undergo flow reduction. Thus if only the tungsten leaching scrubber from a combined secondary tantalum and secondary tungsten and cobalt plant undergoes flow reduction, all incremental costs are assigned to the secondary tungsten and cobalt subcategory, and the compliance costs estimated for the secondary tantalum subcategory remain the same. Where waste streams from both subcategories undergo flow reduction, a new flow ratio is calculated to apportion costs. (This in essence is only a bookkeeping exercise of how to allot this cost; the total costs calculated remain the same); and

(7) In most cases, where a plant has wastewater sources from the nonferrous phase II category and a category other than nonferrous manufacturing (for example, nonferrous forming) we calculated the costs of segregating these different wastewaters. The only exception is for overlap plants between nonferrous phase I and nonferrous phase II, where we estimated costs for combined treatment, and then flowapportioned the costs to each category. This means of cost estimation accounts for the possibility that respective regulations for each category are based on different technologies (and may control different pollutants). (We assumed the costs of segregation even if combined treatment, in practice, is a less costly means of compliance. This is one of a number of areas where the

Agency was knowingly conservative in estimating compliance costs.)

# **IV Data Gathering Efforts**

The data gathering program is described briefly in Section III and in substantial detail in Section V of the General Development Document and the subcategory supplements. A data collection portfolio (dcp) was developed to collect information about the industry and was mailed out on May 6, 1933, under the authority of Section 308 of the Clean Water Act, to each company known or believed to perform smelting and refining of the metals discussed in Section III of this notice in the United States. Several plants were sampled in order to obtain wastewater characterization data. Supplemental data were obtained from NPDES permit files, engineering studies on treatment technologies, and a one-page version of the dcp (called the "mini-dcp") which was mailed out in 1977

EPA reviewed and evaluated existing literature for background information to clarify and define various aspects of the nonferrous metals manufacturing category and to determine general characteristics and trends in production processes and wastewater treatment technology. Review of current literature continued throughout the development of these guidelines. We also reviewed earlier EPA development documents for particular nonferrous metals manufacturing subcategories.

The available information included a summary of the industry describing the production processes, the wastewater characteristics associated with the processes, recommended pollutant parameters requiring control; applicable end-of-pipe treatment technologies for wastewaters; effluent characteristics resulting from this treatment, and a background bibliography. Also included in these studies were detailed production and sampling information for many plants.

Frequent contact has been maintained with industry personnel. Contributions from these sources were particularly useful for clarifying differences in production processes.

The nonferrous metals manufacturing plants were surveyed to gather information regarding plant size, age and production, the production processes used, and the quantity, treatment, and disposal of wastewater generated at these plants. The dcp's also requested economic information including plant capacity, employment, sales, and existing regulatory costs for the base year of 1982. This information was requested in data collection portfolios (dcp's) mailed to all companies known or believed to be engaged in nonferrous metals manufacturing activities. A listing of the companies comprising the nonferrous metals manufacturing industry (as classified by standard industrial code numbers) was compiled by consulting trade associations and the U.S. Bureau of Mines.

In all, dcp's were sent to the corporate headquarters (where they were known) of 220 firms (276 facilities). In many cases, companies contacted were not actually members of the nonferrous metals manufacturing category as it is defined by the Agency. Where firms had operations at more than one location, a dcp was submitted for each plant.

If the dcp's were not returned, we collected information on production processes, sources of wastewater, and treatment technology at these plants by telephone. The information so gathered was validated by sending a copy of the information recorded to the party consulted. The information was assumed to be correct as recorded if no reply was received in 30 days. In total, more than 99 percent of the industry was contacted either by mail or by telephone.

The dcp responses were interpreted individually, and the following data were documented for future reference and evaluation:

- —Company name, plant location, and name of the firm dcp was sent to;
- —Plant discharge status as direct (to surface water), indirect (to POTW), or zero discharge;
- —Production process and waste streams present at the plant, as well as associated flow rates, production rates, operating hours, wastewater treatment, reuse, or disposal methods, and the quality and nature of process chemicals;
- -Capital and annual wastewater treatment costs; and
- —Availability of pollutant monitoring data provided by the plant.

Plants in all the nonferrous metals manufacturing phase II subcategories submitted their questionnaires to the EPA and were covered by the Agency's standard confidentiality procedures. Confidential information was handled in accordance with 40 CFR Part 2.

To aid in the economic analysis, additional industry and market information was obtained from trade associations, Bureau of Mines minerals specialists and several publicly available data bases. Also, a number of the plants are corporations and therefore provide annual reports to their stockholders, and to the Security and Exchange Commission, as required by law. To the extent possible, copies of these reports were obtained and used to estimate financial parameters needed for the economic impact analyses. Finally, further plant-specific information was acquired by calling a number of the plants directly. Details of these phone conversations are available in the record for this proposed rulemaking.

## V Sampling and Analytical Program

The sampling and analysis program for this rulemaking concentrated on the toxic pollutants designated in the Clean Water Act. However, we sampled and analyzed nonferrous metals wastewaters for conventional and nonconventional pollutants as well as inorganic and organic toxic pollutants. The Agency has not promulgated analytical methods for many of the organic toxic pollutants under section 304(h) of the Act, although a number of these methods have been proposed (44 FR 69464 (December 3, 1979); 44 FR 75028 (December 18, 1979)). Additional information on the development of sampling and analysis methods for toxic organic pollutants is contained in the preamble to the proposed regulations for the Leather Tanning Point Source Category, 40 CFR Part 425 (44 FR 38749 (July 2, 1979)).

Information gathered in the data collection portfolios was used to select sites for wastewater sampling. The plants sampled were selected taking into account how well each facility represented the subcategory as indicated by available data, potential problems in meeting technology-based standards, differences in production processes used, and wastewater treatment in place.

After selection of the plants to be sampled, each plant was contacted by telephone, and a letter of notification was sent to each plant as to when a visit would be expected. Generally, a presampling site visit was made in order to acquire facility information necessary for efficient on-site sampling. The information resulted in selection of the sources of wastewater to be sampled at each plant and the sampling techniques to be used. The sample points included, but were not limited to, untreated and treated discharges, process wastewater, and partially treated wastewater.

During this program, 29 nonferrous metals manufacturing plants were sampled.

Wastewater samples were collected in two phases. In the first phase, a large number of plants (21) were sampled in an attempt to characterize all the significant waste streams and

production processes in these industries. In the second phase, we sampled a smaller number of plants (eight), in an attempt to fill any gaps in the data base, and to confirm data acquired during the first phase of sampling. Samples were generally analyzed for 128 of the 129 toxic pollutants and other pollutants deemed appropriate. (Because no safe analytical standard was available for TCDD, samples were never analyzed for this pollutant, although there is no reason that it would be present in nonferrous metals manufacturing wastewater.) At least one plant in every major subcategory was sampled during the data collection effort. with some subcategories sampled at more than one plant, when the production processes were different. For example, both molybdenum sulfide roasting and molybdic oxide reduction plants were sampled in the primary molybdenum and rhenium subcategory. Appendix C details those pollutants not analyzed for.

To avoid unnecessary expense and direct the scope of the sampling program, analyses were not performed for a number of pollutants not expected to be present in a plant's wastewater. This determination was based on raw materials and production processes used. Two sources of information were used for selecting the analyzed pollutants: the pollutants that industry believes or knows are present in their wastewater based on dcp responses. and the pollutants the Agency believes should be present after studying the processes and materials used by the industry. If industry and the Agency did not believe a pollutant or class of pollutants would likely be present in the wastewater after studying the processes and materials used, analyses for that pollutant were not run. EPA collected this information in the following manner.

The 129 toxic pollutants were listed in each dcp and each facility was asked to indicate for each particular pollutant whether it was known to be present or believed to be present. If the pollutant had been analyzed for and detected, the facility was to indicate that it was known to be present. If the pollutant had not been analyzed, but might be present in the wastewater, the facility was to indicate that it was believed to be present. The reported results are tabulated in Section V of each of the subcategory supplements. ٦

Wherever possible, each sample of an individual raw waste stream, a combined waste stream or a treated effluent was collected by an automatic time series compositor during sampling periods as long as 24 hours. Where automatic compositing was not possible, grab samples were taken and composited manually.

EPA used the analytical techniques described in Sampling and Analysis Procedures for Screening of Industrial Effluents for Priority Pollutants, revised in April 1977 A very similar method is found among those proposed on December 3, 1979 (40 FR 69464).

# VI. Industry Subcategorization

In developing this regulation, it was necessary to determine whether different effluent limitations and standards were appropriate for different segments (subcategories) of the industry. The major factors considered in identifying subcategories included: waste characteristics, raw materials used, 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, non-water quality characteristics, and unique plant characteristics.

The Agency set forth a subcategorization scheme based on manufacturing processes in its first proposed regulation for this category on November 30, 1973. EPA stated that manufacturing operations and treatability of wastewaters were considered to be the most significant factors effecting the manner in which the category would be regulated. The proposed regulation on November 30, 1973 (38 FR 33170) established three subcategories, bauxite refining, primary aluminum smelting and secondary aluminum smelting in 40 CFR Part 421. These same subcategories were retained in the final rule promulgated on April 8, 1974 (39 FR 12822).

On February 27, 1975, EPA amended 40 CFR Part 421 by adding five new subcategories, primary copper smelting, primary copper refining, secondary copper, primary lead and primary zinc (40 FR 8514). Again, the manufacturing processes were considered to be the most significant factor in subcategorizing the industry.

On July 2, 1980, EPA modified the subcategorization set forth in the interim final regulation from February 27, 1975 for BPT. The primary copper smelting subcategory was retained. The primary copper refining subcategory which originally included only refinences not on-site with primary copper smelters was changed to the primary copper electrolytic refining subcategory. This new subcategory included all electrolytic refining operations, whether or not they are on-site with a smelter. In addition, EPA added a new subcategory for metallurgical acid plants associated with primary copper smelters. The new subcategory was added because we believed that establishing separate limitations for these three subcategories would ensure that the maximum feasible BPT pollutant reduction could be accomplished for each plant.

On February 17, 1983, EPA proposed to amend 40 CFR Part 421 by adding four new subcategories, primary tungsten, primary columbium-tantalum, secondary silver, and secondary lead (48 FR 7032). Again, the manufacturing processes were considered to be the most significant factor in subcategorizing the industry. These same subcategories were retained in the final rule promulgated on March 8, 1984 (49 FR 8742).

The subcategorization scheme is again modified by today's notice. We again considered raw materials, final products, manufacturing processes, geographical location, plant size and age, wastewater characteristics, nonwater quality environmental impacts, energy costs, and solid waste generation. Our conclusion, as before, is that subcategorization should be based on manufacturing process alone. We are proposing that sulfuric acid plants associated (i.e., on-site) with primary molybdenum roasters be included as part of the metallurgical acid plants subcategory finalized for primary copper, primary lead, and primary zinc metallurgical acid plants on March 8, 1984 (49 FR 8742) (see Section VIII-New Subcategorizations). With respect to the other plants covered by this regulation, the proposed regulation set forth below will amend 40 CFR Part 421-Nonferrous Metals Manufacturing Point Source Category, by adding effluent limitations guidelines, new source performance standards and pretreatment standards for new and existing sources for the following subcategories: primary antimony subcategory (Subpart N), primary beryllium subcategory (Subpart O), primary boron subcategory (Subpart P), primary cesium and rubidium subcategory (Subpart Q), primary and secondary germanium and gallium subcategory (Subpart R), secondary indium subcategory (Subpart S), secondary mercury subcategory (Subpart T), primary molybdenum and rhenium subcategory (Subpart U), secondary molybdenum and vanadium subcategory (Subpart V), primary nickel and cobalt subcategory (Subpart W), secondary nickel subcategory (Subpart X), primary precious metals and mercury subcategory (Subpart Y). secondary precious metals subcategory (Subpart Z), primary rare earth metals

subcategory (Subpart AA), secondary tantalum subcategory (Subpart AB), primary and secondary tin subcategory (Subpart AC), primary and secondary titanium subcategory (Subpart AD), secondary tungsten and cobalt subcategory (Subpart AE), secondary uranium subcategory (Subpart AF), and primary zirconium and hafnium subcategory (Subpart AG). As discussed in Section II, EPA is proposing minor technical amendments to the bauxite refining subcategory (Subpart A). We are also considering establishing concentration limits for three pollutants (2-chlorophenol, phenol, and phenols (4AAP) in the net precipitation discharges from bauxite red-mud ponds and soliciting comments on limitations for these three pollutants in these discharges. (See Section XI for a detailed discussion of the limitations under consideration).

## VII. Available Wastewater Control and Treatment Technology

# A. Control Technologies Considered

The control and treatment technologies available for this category include both in-process and end-of-pipe treatments. These technologies were considered appropriate for the treatment of nonferrous metals manufacturing wastewater and formed the basis for the regulatory options. These control and treatment technologies are discussed in greater detail in Section VII of the General Development Document. The applicability of each of the technologies to specific sources of wastewater is discussed in the subcategory supplements.

In-process treatment includes wastewater flow reduction through the practice of recycle. Recycling of process water 13 the practice of returning water to the process to be used again for the same purpose either with or without treatment. In establishing BPT for secondary precious metals and other subcategories, EPA considered complete recycle and reuse of equipment and floor wash water after treatment with chemical precipitation and sedimentation to remove suspended solids and metals. EPA also considered partial recycle of process water by using cooling towers and holding tanks. In doing so, we considered that it may be necessary to discharge a bleed stream to purge dissolved and suspended solids that tend to accumulate in the system.

Dry scrubbing can be used in specific applications as an alternative to wet air pollution control, thereby avoiding the discharge of wastewater. It's application is generally limited to control of particulate emissions and has only been considered in that context in this rulemaking. Dry scrubbing, as it was considered in this rulemaking, is accomplished through the use of baghouses.

End-of-pipe treatment includes technologies used to reduce pollutant concentrations prior to discharge. The following end-of-pipe treatments are considered for this proposal:

considered for this proposal: *Chemical Precipitation*. Chemical precipitation generally involves adjusting the pH through chemical addition to precipitate out of solution metal ions (e.g., copper) and certain anions (e.g., fluoride). The chemical commonly associated with this treatment is lime; however, sulfide, caustic or acid are also used depending on the specific situation.

Sedimentation. Sedimentation is a process which removes solid particles from a liquid matrix by gravitational force. This is done by reducing the velocity of the feed stream in a large volume tank or lagoon so that gravitational settling can occur. This treatment when combined with chemical precipitation is frequently referred to as lime and settle treatment.

Ammonia Steam Stripping. Steam is used to remove ammonia from process wastewater. Generally, the steam is introduced into a separation column countercurrent to the process wastewater. The ammonia is absorbed into the steam. In some instances it may be necessary to add lime so that the pH of the wastewater is elevated in order to remove more stable ammonia compounds.

Cyanide Precipitation. Cyanide can be precipitated out of solution using ferrous sulfate. The cyanide is generally complexed with ferrous sulfate at a pH of 9. It is subsequently precipitated with ferrous sulfate addition at pH 3.

Oil Skimming. Oil and other materials with a specific gravity less than water often float unassisted to the surface of the wastewater. Skimming removes these floating wastes usually in a tank designed to allow floating debris to rise while the water flows to an outlet located below the floating layer. A variety of devices are used to remove the floating layer from the surface.

Carbon Adsorption. The use of activated carbon to remove dissolved organics is one of the most efficient organic removal processes available. The carbon removes contaminants from water by the process of adsorption or the attraction and accumulation of one substance on the surface of another. Activated carbon preferentially adsorbs organic compounds and because of this selectivity is particularly effective in removing organic compounds from aqueous solution.

Multimedia Filtration. Gravity mixedmedia filtration may be used as an endof-pipe polishing step to reduce concentrations of toxic metals and total suspended solids. Rapid sand or pressure filters would perform as well.

### B. Status of In-Place Technology

Current wastewater treatment practices in the total nonferrous metals manufacturing category range from no treatment to treatment with chemical precipitation, sedimentation and filtration. Of the 236 discharging plants, 121 plants have chemical precipitation and sedimentation treatment to remove metals and suspended solids, 12 have technologies for the control of cyanide, four have technology for oil removal, eight practice ammonia stripping and 25 practice end-of-pipe filtration. The remainder of the dischargers did not report any treatment for their nonferrous metals manufacturing wastewaters.

Recycle after treatment consisting of lime precipitation and sedimentation is practiced at 22 plants. Thirty-nine plants practice recycle of scrubber water without any treatment.

# C. Control and Treatment Options

EPA considered the following treatment and control options as the basis for BPT, BAT, NSPS, PSES, and PSNS for those facilities included by today's rulemaking within the nonferrous metals manufacturing category.

Option A—End-of-pipe treatment consisting of chemical precipitation and sedimentation, and preliminary treatment, where necessary, consisting of oil skimming, cyanide precipitation, and ammonia steam stripping. This combination of technology reduces toxic metals and cyanide, conventional and nonconventional pollutants.

Option B.—Option B is equal to Option A preceded by flow reduction of process wastewater through the use of cooling towers for contact cooling water and holding tanks for all other process wastewater subject to recycle.

Option C—Option C is equal to Option B plus end-of-pipe polishing filtration for further reduction of toxic metals and TSS.

Option D—Option D is equal to Option C plus treatment of isolated waste streams with activated carbon adsorption for removal of toxic organics and activated alumina for reduction of fluorides and arsenic concentrations. This option was only considered for nonferrous metals phase I and is retained here only for consistency. Option E—Option E consists of Option C plus activated carbon adsorption applied to the total plant discharge as a polishing step to reduce toxic organic concentrations.

Option F—Option F consists of Option C plus reverse osmosis treatment to attain complete recycle of all process wastewater. This option was only considered for nonferrous phase I.

Option G—Option G consists of chemical oxidation applied to the total plant discharge, as a step to reduce toxic organic concentrations, without any other end-of-pipe treatment or pretreatment.

VIII. Substantive Changes From Prior Regulations

The regulations proposed today contain several substantive changes to regulations proposed and promulgated previously.

A. New Subcategorizations. As discussed in Section VI of today's notice, EPA is proposing to include metallurgical acid plants associated (i.e., on-site) with primary molybdenum roasters as part of the metallurgical acid plants subcategory finalized on March 8. 1984 (49 FR 8742). All these plants would accordingly have identical effluent limitations and standards. In making this determination, the Agency considered the way in which acid plants are operated when associated with the primary smelters and the characteristics of the wastewater generated by each type of acid plant. Our conclusion is that these processes, rate of process discharge, and wastewater matrices are essentially identical justifying a single subcategory for all acid plants.

Metallurgical acid plants are constructed on-site with primary copper, lead, zinc, and molybdenum smelters to treat the smelter emissions, remove the sulfur dioxide, and produce sulfuric acid as a marketable by-product. Although two basic technologies, single contact and double contact, are used in the industry, the Agency found no predominance of either technology in place in plants of the four metal types. Nor was there any significant observable difference in the amount of water discharged from plants using the two technologies. Finally, the Agency found no difference in the characterization of the wastewater at plants which burn supplemental sulfur to enhance the performance of the acid plant.

The processes are also similar in terms of waste streams generated. Wastewaters are typically combined in acid plants into a single waste stream (acid plant blowdown). Principal streams going into the blowdown (compressor condensate, blowdown from acid plant scrubbing, mist precipitation, mist elimination, and steam generation) are common to all four types of plants.

The wastewater matrices from all four types of acıd plants also are sımilar. The Agency reviewed the analytical data that were obtained in sampling programs described in Section V and compared the characteristics of untreated acid plant blowdown from plants associated with each of the four primary metals considered. There were similar concentrations (i.e., in the same order of magnitude) of antimony, arsenic, chromium, mercury, and selenium, among the four. All of these metals were present at concentrations that are treatable to the same effluent concentration upon application of chemical precipitation and sedimentation or chemical precipitation, sedimentation and multimedia filtration, and are within the range used in calculating treatment effectiveness for these technologies.

Therefore, in light of these essential similarities of process, wastewater flow and composition, we have chosen to include all acid plants in a single subcategory.

B. Building Blocks. The regulations proposed today use the so-called building block approach promulgated for phase I, whereby EPA considers both end-of-pipe treatment technologies and process changes and controls within the plant prior to discharge to a common end-of-pipe treatment system. (This examination, of course, is mandated by the Clean Water Act. See e.g., sections 304(b)(2)(A) and 306(a)(1).) As a result, the proposed regulation identifies principal process steps that discharge wastewater, determines what wastewater flows (and in some cases, pollutant concentrations) are permissible for this indigenous operation, and establishes a mass-based limitation or standard for each such step ("building block"). These limitations (or standards) then are added together to give the permissible mass-based discharge for the entire process.

Under the building block approach proposed today, to determine the allowable discharge from a point source a discharger must first identify the specific process sources that comprise that discharge. He should then multiply the limitations or standards (mg/kkg or mg/troy ounce) for each wastewater present in his plant, shown today in 40 CFR Part 421, by the production of that source (kkg or troy ounce), in the units specified, to yield the mass discharge from each source. The mass from all of the sources should then be added to yield the maximum for any one day and the maximum for monthly averages for that discharge point. Waste streams not identified in today's notice may be regulated on a case-by-case basis by the permit writer pursuant to the authority granted in section 402.

We stress that a plant is to receive a discharge allowance for a particular building block only if it is actually operating that particular process. The plant need not be discharging wastewater from the process to receive the allowance, however. Thus, if the regulation contains a discharge allowance for wet scrubber effluent and a particular plant has dry scrubbers, it cannot include a discharge allowance for wet scrubbers as part of its aggregate limitation. On the other hand, if it has wet scrubbers and discharges less than the allowable limit (or does not discharge from the scrubbers), it would receive the full regulatory allowance. In this way, the building block approach recognizes and accommodates the fact that not all plants used identical steps in manufacturing a given metal.

C. Building Block Approach Applied to Integrated Facilities. There are several facilities within this category that have integrated manufacturing operations; that is, they combine wastewater from smelting and refining operations, which are part of this point source category, with wastewater from other manufacturing operations which are not a part of this category, and treat the combined stream prior to discharge. Indirect dischargers that are integrated facilities are subject to pretreatment standards as specified by the "combined waste stream formula" set forth at 40 CFR 403.6(e). In establishing direct discharger permit requirements for integrated facilities subject to effluent guidelines that are mass-based for each category, the permit writer can apply the same building block approach discussed above, simply aggregating each allowable discharge.

As an example, we will use a facility which combines secondary precious metals and secondary silver refining, and precious metals forming wastewater and treats this water in a waste treatment system prior to discharge. The permit writer must first identify the manufacturing operations using process water in the facility. The facility in this example discharges wastewater from gold precipitation and filtration, precipitation and filtration of nonphotographic solutions (silver), and surface treatment runse water. Then by multiplying the production calculated according to 40 CFR 122.63(b)(2) for each of these operations by the limitations or

standards in 40 CFR Pat 421 for both precipitation and filtration waste streams and in 40 CFR Part 471 for surface treatment rinse water and by summing the product obtained for each of these waste streams, the permit writer can obtain the allowable mass discharge.

If, for example, the production of gold resulting from gold precipitation and filtration is 200,000 troy ounce per year, the production of silver resulting from precipitation and filtration of nonphotographic solutions is 159,000 troy ounce per year, and the surface treatment rinse water production is 7.774 off-kkig of precious metals surface treated per year, the maximum for any one day limitation based on the best available technology economically achievable (BAT) for the pollutant copper is 1.7439 kg/yr as calculated below:

## Gold Precipitation and Filtration

200,000 troy ounce/yr×5.632 mg/troy ounce=1.1264 kg/yr

# Precipitation and Filtration of Nonphotographic Solutions

150,000 troy ounce/yr×3.930 mg/troy ounce=0.5895 kg/yr

# Surface Treatment Rinse Water

7.774 Off-kkg/yr×3,600 mg/kkg=0.028 kg/yr

Total=1.7439 kg/yr

In establishing limitations for integrated facilities for which a portion of the plant is covered by concentrationbased limitations, the permit writer can determine the appropriate mass limitations for the entire facility or point source as follows. The portion of the wastewater covered by this category receives mass limitations according to the building block methodology described above. The permit writer must then determine an appropriate flow for the portion of the facility subject to concentration-based limitations and multiply it by the concentration limitations to yield mass limitations. The mass limitations applicable to the discharge are obtained by summing these two sets of mass limitations.

Under § 403.12(b)(4) of the General Pretreatment Regulations, a facility must monitor the flow of regulated process streams and other streams as necessary to allow use of the Combined Wastestream Formula. A facility must monitor the flows of its regulated streams. However, a facility can avoid monitoring its other streams (unregulated and dilute) under this section by agreeing to meet a mass limitation at least as stringent as the one

which would be calculated under the Combined Wastestream Formula if these other streams were taken into consideration. An integrated nonferrous metals manufacturing facility combining regulated process streams with either unregulated or dilute streams, or both, can avoid monitoring the flows of those streams if it agrees to meet the mass limit calculated solely through use of the limits applicable to the regulated streams. Such a limit would be as stringent as any which could possibly be derived under the formula if either the unregulated or dilute streams, or both, were taken into consideration. If, however, the facility desires to take into account potential pollutants contained in these unregulated or dilute streams. monitoring of these streams will be required to enable calculation of the alternative limit under the formula.

It should be noted that it is an entirely different matter where concentrationbased rather than mass-based limits are involved. A facility cannot, for example, avoid monitoring unregulated or dilute streams by agreeing to meet the concentration limit applicable to its regulated streams. This is because application of the formula could result in a more stringent concentration-based limit if the unregulated or dilute streams were taken into consideration.

As an example, we will use a facility which combines process wastewater from a mill using froth flotation to concentrate copper ore with SO2 scrubber water from a primary molybdenum roaster. The portion of the limitations attributable to the roaster SO<sub>2</sub> scrubber water is calculated by multiplying the limitations in subpart U of 40 CFR Part 421 in today's notice by the molybdenum sulfide roasted production. The permit writer must then determine the appropriate flow for the discharge from the mill and multiply it by the concentrations set forth in subpart J of 40 CFR Part 440 at 47 FR 54618. If the molybdenum sulfide roasted production is 175,000 kkg per year and the flow from the froth flotation mill 1s 2,000,000 liters per year, the maximum for any one day limitation based on the best available technology economically achievable (BAT) for the pollutant nickel is 1511.7 kg/yr as calculated below:

# Froth flotation mill wastewater

2,000,000 1/yr $\times$ 0.2 mg/1 $\times$ 1 kg/10 <sup>6</sup> mg=0.4 kg/yr

# SO<sub>2</sub> Scrubber Water

8.636 mg/kg×175,000 kkg/yr=1511.3 kg/ yr

Total=1511.7 kg/yr

The Agency recognizes that there may be different technology bases for the limitations and standards applicable to an integrated facility. As an example, the technology basis for BAT for tin smelting 1s chemical precipitation, sedimentation and filtration whereas the technology basis for BAT for tin forming is lime precipitation and sedimentation. EPA developed these limitations based on specified in-plant controls and endof-pipe treatment technology; however, it does not require that the facility implement these specific in-plant controls and end-of-pipe technology. The facility combining wastewater from manufacturing operations covered by the two categories must install technology and modify the manufacturing operations so as to comply with the mass limitations.

D. Allowances for Net Precipitation in Bauxite Refining. Promulgated BPT and BAT limitations for the bauxite refining subcategory are based on use of settling impoundments. Facilities in this subcategory are subject to a zero discharge requirement; however, they can discharge on a monthly basis a volume of water equal to the difference between precipitation that falls within the impoundment and evaporation within that impoundment for that month.

We are proposing today to make minor technical amendments to delete or correct references to FDF considerations under Part 125 and pretreatment references to Part 128. We are giving consideration to establishing concentration-based limitations on the net precipitation discharge to control the discharge of phenol based toxic pollutants. Samples of red-mud impoundment discharges collected by EPA showed treatable concentrations of two listed toxic organic compounds. phenol and 2-chlorophenol, and phenols (4AAP). The concentration-based limitations we are considering are based on carbon adsorption treatment of the net precipitation discharge. We formally solicit comment on concentration-based limitations for these pollutants in the net precipitation discharge for bauxite refining.

# IX. Summary of Generic Issues

EPA has identified several issues that are generic to many of the subcategories and to the limitations and standards proposed in today's notice. (Many of these issues were identified as a result of the Agency's consideration of public comment on the phase I portion of this rulemaking.) These issues are discussed in this section, rather than in the discussion of each particular subcategory. A. Data Bases to Determine Achievable Concentrations and Variability Factors for Hydroxide Precipitation-Sedimentation and for Filtration. As discussed in Section VII, chemical precipitation-sedimentation and filtration were considered as a part of various treatment options for BPT, BAT, NSPS, PSES and PSNS. The methods of determining achievable concentrations and variability factors used to compute monthly average and daily maximum concentrations are discussed for these technologies below.

a. Hydroxide Precipitation-Sedimentation. In considering the performance achievable using hydroxide (usually lime) precipitationsedimentation of metals with and without polishing filtration, EPA evaluated data for 23 pollutants from 10 subcategories in nonferrous metals manufacturing phase II and plants in other categories with similar wastewater. The data base we selected for lime precipitation and sedimentation (lime and settle) without filtration is the so-called combined metals data base. (See generally 49 FR 8742, March 8, 1984.)

The data base for the performance and variability of hydroxide precipitation-sedimentation 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, collectively called the combined metals data base ("CMDB"), include influent and effluent concentrations for nine pollutants. The wastewaters from each of the five categories have been found to be statistically similar in all material respects. A study of statistical homogeneity of these wastewaters is part of the record for this rulemaking.

Two analyses were performed to evaluate these two sets of data. First. the mean wastewater pollutant concentrations of categories in the CMDB were compared statistically with the mean wastewater pollutant concentrations in the nonferrous data base. The technique used to compare these data is referred to as analysis of variance. The analysis of variance methodology is well known to statisticians and is sometimes referred to as a homogeneity analysis. The primary result of the analysis is that, except for lead (Pb), there was no statistical difference detected between the mean effluent pollutant concentrations from categories in the CMDB and the mean effluent pollutant concentrations from the nonferrous

phase II category. The differences in mean effluent Pb concentration will be resolved by using the treatment effectiveness concentrations for Pb which have been developed from a data base which includes over 200 Pb concentration measurements from the effluent wastewaters of several lead battery manufacturing and/or secondary lead plants that employ lime precipitation and sedimentation treatment. The treatment effectiveness concentrations that were developed are substantially larger than those estimated from the CMDB. The procedures used to develop these Pb treatment effectiveness concentrations are described in a memorandum which is included in the record to this proposed rulemaking. The other analysis that the Agency conducted to support the nonferrous phase II proposed rule also employed analysis of variance. The analysis of variance in this second analysis compares the mean wastewater pollutant concentrations among the nonferrous phase II subcategories. The results indicate that the mean pollutant concentrations measured in the subcategories of the nonferrous phase II category are generally similar across subcategories. A report which describes the methodology and results of the analysis of variance comparisons that have been performed to support the nonferrous phase II proposed rulemaking is also included in the record.

We view the use of the combined metals data base as appropriate for setting effluent limitations for the following six pollutants in nonferrous metals manufacturing plants: cadmium, copper, lead, nickel, zinc, and TSS. There are several reasons for this conclusion:

(1) Process Chemistry: We believe that properly operated hydroxide precipitation and sedimentation will result in effluent concentrations that are directly related to pollutant solubilities. Since the nonferrous metals manufacturing raw wastewater matrix contains the same toxic pollutants in the same order of magnitude (for the most part) as the combined metals data base raw wastewater and the technology is solubility-based, we believe the mean treatment process effluent variability will be identical.

(2) Homogeneity: EPA examined the statistical similarity among wastewater pollutant concentrations in the nonferrous subcategories, as well as between the pooled nonferrous subcategories and the CMDB. The purpose of these analyses was to test the Agency's engineering hypothesis that the mean untreated wastewater concentrations in the nonferrous category were similar to those in the CMDB. In general, the results of the analysis showed that the nonferrous subcategories are statistically similar with respect to mean pollutant concentrations across subcategories. The results also show that the nonferrous metals manufacturing pollutant concentration data combined across subcategories are comparable to the CMDB pollutant concentration data. The similarity of nonferrous and CMDB untreated and treated wastewater pollutant concentrations was established through a statistical assessment. The results of the statistical analysis provide further support to EPA's engineering evaluation that hydroxide precipitation and sedimentation treatment in the nonferrous category reduces the toxic metal pollutant concentrations achieved by the same technology applied to the wastewater from the categories in the CMDB.

We are proposing limits based on chemical precipitation and sedimentation technology for certain pollutants not included in the combined metals data base. Treatment performance concentrations for these pollutants are calculated either from nonferrous metals manufacturing data (for arsenic, selenium, silver, antimony, boron, molybdenum, and tin), or from categories with wastewaters similar to nonferrous metals manufacturing (fluoride from electrical components manufacturing data, cobalt from porcelain enameling data, and uranium and radium 226 from ore mining and dressing data). No treatment effectiveness concentrations are available for germanium, indium and titanium which are proposed for limitation in some subcategories. For these pollutants we have selected treatment effectiveness concentrations by comparing the theoretical solubilities of these pollutants to pollutants in the CMDB at comparable pH levels. As we have discussed above, hydroxide precipitation and sedimentation technology is to a degree solubility related. As such, we believe that these additional pollutants will be reduced to the same effluent concentrations as the corresponding pollutant in the CMDB.

b. *Filtration*. EPA established the pollutant concentrations achievable with lime precipitation, sedimentation, and polishing filtration with data from three plants with the technology inplace: one (phase I) nonferrous metals manufacturing plant and two porcelain enameling plants whose wastewater is

similar (as determined by statistical analysis for homogeneity) to wastewater generated by nonferrous metals manufacturing plants. In generating long-term average standards, EPA applied variability factors based on the pooled variances from the combined metals data base because the combined data base provided a broader statistical basis for computing variability than the data from the three plants sampled. The use of lime and settle combined data base variability factors is probably a conservative assumption because filtration 1s a less variable technology than lime and settle, since it is less operator-dependent.

For pollutants for which there were no data relating to filtration effectiveness from these three plants, long-term concentrations were developed assuming that removal by filtration would remove 33 percent more pollutants than lime precipitation and sedimentation. This assumption was based upon a comparison of removals of several pollutants by lime precipitation, sedimentation, and filtration which showed 33 percent incremental removal attributable to filtration.

EPA selected this approach because of the extensive long-term data available from these three plants. We believe that the use of polishing filtration data from procelain enameling plants is justified because procelain enameling was included in the combined metals data base. Since we have determined that lime precipitation and sedimentation will produce identical results on both nonferrous metals manufacturing and procelain enameling wastewater, it is reasonable for the Agency to assume that polishing filters treating these identical intermediate waste streams will produce an identical final effluent.

c. Ammonia Steam Stripping. This technology is used routinely to reduce ammonia concentrations. To evaluate treatment effectiveness, EPA collected chemical analysis data of raw waste (treatment influent) and treated waste (treatment effluent) from one plant m the iron and steel manufacturing category. These data form the data base for determining the effectiveness of ammonia steam stripping technology in this category and are contained within the administrative record supporting this regulation. We believe this treatment performance can be transferred to nonferrous subcategories because the technology is solubility related and the nonferrous subcategories considered here do not contain interfering agents

that would reduce ammonia removal effectiveness.

An arithmetic mean of the treatment effluent data (from iron and steel) produced an ammonia long-term mean value of 32.2 mg/l. The one-day maximum, 10-day, and 30-day average concentrations attainable by ammonia steam stripping were calculated using the long-term mean of the 32.2 mg/l and the variability factors that express an overall pooled variance estimate developed from the combined metals data base. This produced ammonia concentrations of 133.3, 58.6, and 52.1 mg/l ammonia for the one-day maximum, 10-day, and 30-day averages, respectively.

The Agency has verified the proposed steam stripping performance values using steam stripping data collected at a zirconium-hafnium plant, a plant in the nonferrous phase II category, which has raw ammonia concentrations comparable to those in the iron and steel manufacturing data. Data collected by the plant represent almost two years of daily operations, and support the long-term mean used to establish treatment effectiveness.

There is one exception to this discussion. In those subcategories where we are not altering existing BPT requirements—bauxite refining and metallurgical acid plants—those limitations necessarily continue to be based on subcategory specific data.

BAT limitations for all subcategories employing filtration will be based on the data base for polishing filtration discussed above.

We solicit comment on our use of the combined data base for nonferrous metals manufacturing. We specifically request submission of additional data from nonferrous metals manufacturing plants using properly operated lime and settle and lime, settle, and filtration systems.

B. Mass-Based Standards vs. Concentration-Based standards for PSES and PSNS. In proposing PSES and PSNS, we considered whether to propose exclusively mass-based standards, or to allow POTW the alternative of concentration or massbased standards. Mass-based standards ensure that limitations are achieved by means of pollutant removal rather than by dilution. They are particularly important when a mass limitation is based upon flow reduction technology because pollutant reductions associated with the flow reduction cannot be ensured except by a reduction in the amount of pollutant allowed to be discharged. Mass-based standards, however, are harder to implement because POTWs face increased

difficulties in monitoring. POTW also must develop specific limits for each plant based on the unit operations present and the production occurring in each operation. We have resolved these competing considerations by proposing mass-based standards for PSES and PSNS where we believe that the incremental pollutant removals associated with flow reduction are significant enough to warrant massbased standards.

C. pH. In those subcategories where we are first proposing BPT, we are proposing pH limitations of 7.5 to 10. We are proposing this range to allow for proper performance of the lime precipitation and sedimentation technology. This technology generally requires a wastewater pH of 8.8 to 9.3 (depending on wastewater compositions) to achieve optimum precipitation of toxic metals. This level is somewhat different from the pH 6-9 limitations that the Agency has set for BPT in the past. We are proposing the higher range to allow for proper performance of the lime and settle treatment without requiring the addition of acid to adjust the pH before discharge.

D. Frequency of Sampling to Demonstrate Compliance with 30-Day Average Limitations. The proposed regulation establishes monthly average limitations that are based on the average of 10 consecutive sampling days (not necessarily consecutive calendar days). The 10-day average value was selected as the minimum number of consecutive samples which need to be averaged to arrive at a stable slope on a statistically based curve relating oneday and 30-day average values and it approximates the most frequent monitoring requirements of direct discharge permits. The monthly average numbers shown in the regulation are to be achieved regardless of the number of samples averaged and are to be used by plants with combined waste streams that use the "combined waste stream formula"set forth in 40 CFR 403.6(e) and by permit writers in writing direct discharge permits.

E. Compliance Date for PSES. The Agency is proposing that the date for compliance with PSES for existing indirect dischargers subject to this rulemaking be three years from the date of promulgation. Few indirect dischargers in this category have installed and are properly operating the treatment technology for PSES. In addition, the readjustment of internal processing conditions to achieve reduced wastewater flows may require further time above installation of end-ofpipe treatment equipment. Many plants in this and other industries also will be installing the treatment equipment suggested as model technologies for this regulation which may result in delays in engineering, ordering, installing, and operating this equipment. Under these circumstances, we think that three years is the appropriate compliance date under Section 307(b)(1) of the Act. We invite comment on the appropriateness of the compliance date.

F Recycle of Wet Scrubber and Contact Cooling Wastewater. We are proposing as BAT and PSES for most subcategories that 90 percent of wet air pollution control and contact cooling wastewater be recycled (we have proposed a higher rate for certain subcategories where reported rates of recycle are even higher). Water is used in wet air pollution control systems to capture particulate matter or fumes evolved during manufacturing. Cooling water is used to remove excess heat from cast metal products.

We observed extensive recycle of these streams throughout the category. Indeed, some plants reported 100 <sup>9</sup> percent recycle of process wastewater from these operations. The Agency believes, however, that most plants may have to discharge a portion of the recirculating flow to prevent the buildup of dissolved solids. The Agency believes that through operation of cooling towers with a discharge of 10 percent of the recirculating flow, contact cooling water and scrubber water can be reused while controlling scale formation, equipment corrosion and maintaining product quality.

Existing practice in nonferrous phase 1 and phase II supports our selection of a 90 percent recycle rate. Ninety percent recycle is extensively demonstrated in phase I (see 48 FR 7052 and subcategory supplements to the General Development Document).

Twenty-two of 29 secondary precious metals plants using wet air pollution control, four of eight primary precious metals and mercury plants, one secondary mercury plant, one secondary molybdenum and vanadium plant, and one of the two discharging primary molybdenum and rhenium plants practice recycle.

In determining the flow allowance, the Agency examined the production normalized flows for each operation. From the data set for each operation, a normalized flow allowance was developed based on existing performance. In most cases, the normalized flow is not based on recycle with the exception of those instances where recycle is widely demonstrated for a production operation, as it is for wet scrubbing operations. Plants that were found to use an excessive amount of water on a production normalized basis when compared to other plants were not included in developing the flow allowance. The BAT flow allowance based on recycle was then calculated by reducing the normalized flow by a factor of 10 to require 90 percent recycle.

The Agency would like to point out that the regulations do not require each plant to achieve 90 percent recycle to meet these promulgated mass allowances. For example, a plant achieving the lowest process water use observed in the subcategory may only need to recycle 50 percent or less.

The Agency realizes that the flow rates for wet scrubber streams may not be possible without preliminary treatment to remove the material that has been scrubbed. In developing compliance costs, the Agency carefully examined current methods of recycle and pretreatment for each wet scrubbing operation. Costs for in-process flow reduction were then developed based on the demonstrated recycling methods. In many instances, we developed costs for preliminary treatment consisting of holding and settling tanks to remove suspended solids, while in other (most unusual) instances we developed costs for lime and settle treatment used to achieve recycle of the scrubber liquor.

G. Cost of Compliance at Integrated Facilities. As discussed in section VIII (Building Block Approach Applied to Integrated Facilities), integrated facilities subject to both this proposed regulation and to regulations for other point source categories must install technology and modify processes so as to comply with mass limitations calculated using the building block approach. In estimating the cost of compliance with this proposed regulation, we did not generally include specific costs associated with integrated facilities.

We believe this approach is justified for plants not currently providing BPT or BAT because we have included costs for separate treatment of wastewater in calculating costs associated with each regulation. Costs associated with the segregation of the combined waste streams are not normally significant compared to the cost of the treatment equipment. However, we did include the cost of piping and peripherals needed to route non-phase II wastewater away from phase II treatment.

For plants currently providing BPT or BAT on combined wastewater, we believe compatibility of combined treatment is demonstrated by these plants' own conduct. Therefore, we do not believe this proposed regulation will require segregation and separate treatment at these plants.

We solicit comment on these assumptions. We also request cost data from plants that have experienced costs or that have developed cost estimates that reflect specific costs associated with integrated facilities.

# X. Best Practicable Technology (BPT) Effluent Limitations

The factors considered in defining best practicable control technology currently available (BPT) include the total cost of applying technology in relation to the effluent reduction benefits derived, the age of equipment and facilities involved, the processes employed, nonwater quality environmental impacts (including energy requirements), and other factors the Administrator considers appropriate. In general, the BPT level represents the average of the best existing performances of plants of various ages. sizes, processes or other common characteristics. Where existing performance is uniformly inadequate. BPT may be transferred from a different subcategory or category. Limitations based on transfer technology must be supported by a conclusion that the technology is, indeed, transferable and a reasonable prediction that it will be capable of achieving the prescribed effluent limits. See Tanners' Council of America v. Train, 540 F. 2d 1188 (4th Cir. 1976). BPT focuses on end-of-pipe treatment rather than process changes or internal controls, except where such are common industry practice.

The basic end-of-pipe treatment for BPT in this rulemaking is lime and settle treatment. We are transferring lime and settle treatment technology and performance for the primary antimony. primary beryllium, primary boron. primary cesium and rubidium, primary and secondary germanium and gallium. secondary indium, secondary mercury, primary molybdenum and rhenium. secondary molybdenum and vanadium, primary nickel and cobalt, secondary nickel, primary precious metals and mercury, secondary precious metals, primary rare earth metals, secondary tantalum, primary and secondary tin. primary and secondary titanium. secondary tungsten and cobalt, secondary uranium, and primary zirconium and hafnium subcategories from aluminum forming, copper forming, battery manufacturing, porcelain enameling and coil coating plants. As discussed in section IX of this preamble, Summary of Generic Issues, the data base for the performance of lime and settle is a composite of data from the

industrial categories listed known as the combined metals data base (CMDB). This data base was selected because lime and settle treatment applied to nonferrous metals manufacturing wastewater in each of the subcategories listed above will result in effluent concentrations identical to those achieved by the plants in the CMDB. This is based on the fact that the raw wastewater matrix in each of these subcategories contains the same pollutants in the same order of magnitude as the combined metals data base raw wastewater. The CMDB was also selected because it was determined to be homogeneous with the raw wastewaters in these subcategories.

We are transferring steam stripping technology and performance for ammonia removal in the primary molybdenum and rhenium, secondary molybdenum and vanadium, primary nickel and cobalt, secondary tungsten and cobalt, secondary uranium, secondary precious metals, primary and secondary tin and primary zirconium and hafmum subcategories of the nonferrous metals manufacturing phase II from one iron and steel manufacturing plant. As discussed in Section IX of this preamble, Summary of Generic Issues, we believe that steam stripping performance can be transferred to these subcategories because the technology is solubility related, and because the raw wastewater concentrations of ammonia in these subcategories and in iron and steel manufacturing are similar. We believe that plants in these subcategories will achieve effluent concentrations identical to those achieved by the one iron and steel plant.

One plant in the secondary precious metals subcategory currently uses cyanide precipitation to treat process wastewater. We are transferring cyanide precipitation technology and performance for the secondary precious metals, primary and secondary tin, and the primary zirconium and hafnium subcategories in nonferrous metals manufacturing phase II from coil coating plants. We believe that the technology is transferrable to these subcategories because the raw wastewater concentrations are of the same order of magnitude as those observed in coil coating wastewater. In that cyanide precipitation converts all cyanide species to complex cyanides and that precipitation of the complexed cyanides is solubility related, we believe that the technology will achieve identical effluent concentrations in both categories.

The cost-benefit inquiry for BPT is a limited balancing, committed to EPA's

discretion, which does not require the Agency to quantify benefits in monetary terms. See, e.g. American Iron and Steel Institute v. EPA, 526 F 2d 1027 (3rd Cir. 1975). In balancing costs in relation to pollutant removal benefits, EPA considers the volume and nature of existing discharges, the volume and nature of discharges expected after application of BPT, the general environmental effects of the pollutants, and the cost and economic impacts of the required pollution control level. The Act does not require or permit consideration of water quality problems attributable to particular point sources or industries, or water quality improvements in particular water quality bodies. Accordingly, water quality considerations were not the basis for selecting the proposed BPT. See Weyerhaeuser Company v. Costle, 590 F 2d 1011 (D.C. Cir. 1978).

In developing the proposed BPT limitations, the Agency considered the amount of water used per unit production in each waste stream. These data were used to determine the average (mean) water discharge for each subcategory operation. Aberrant flows were excluded from mean calculations. Since the proposed BPT limitations were based on the average water discharge, plants with greater than average discharge flows may have to implement some method of flow reduction in order to achieve the effluent limits of BPT.

Next, we evaluated the appropriate treatment technology for BPT treatment. The proposed BPT level treatment for each subcategory was based on the average of the best existing performance currently demonstrated throughout that subcategory. As stated above, BPT was based on end-of-pipe treatment technologies except in those instances where a process change or internal control is common practice in the subcategory. As an example, both of the plants in the rare earth metals subcategory that use wet air pollution control on electrolytic refining operations discharge no process wastewater through by-product recovery of the scrubber liquor. We are proposing zero discharge from this stream because by-product recovery is so widely demonstrated for this waste stream.

The effluent concentrations resulting from the application of the proposed model BPT technology are identical for all wastewater streams; however, the mass limitations vary for each waste stream depending on the regulatory flow. The BPT limitations were calculated by multiplying the effluent concentrations (mg/1) achievable by the selected option technology by the regulatory flow (1/kg production normalizing parameter) established for each waste stream.

Where we already have promulgated BPT, we are not proposing to alter these existing limitations because we have determined that the existing regulation adequately characterizes BPT and because the 1984 BAT compliance date is imminent. We therefore are leaving unaltered existing BPT limitations for the bauxite refining subcategory and are proposing to alter only the applicability of the metallurgical acid plants subcategory.

To fulfill our statutory obligation, we are proposing BPT in those subcategories we have not addressed previously, namely primary antimony, primary beryllium, primary molybdenum and rhemum, secondary molybdenum and vanadium, primary nickel and cobalt, primary precious metals and mercury, secondary precious metals, primary rare earth metals, secondary tantalum, primary and secondary tin, primary and secondary titanium, secondary tungsten and cobalt. secondary uranium, primary and secondary germanium and gallium and primary zirconium and hafnium. We also are proposing that molybdenum metallurigical acid plants be subject to existing limits already promulgated for copper, lead, and zinc metallurgical acid plants. We are not proposing BPT for the five subcategories without direct discharging plants: primary boron. primary cesium and rubidium, secondary indium, secondary mercury. and secondary nickel. Our basis for these decisions is explained below. The pollutant reduction benefits from applying BPT in the regulated subcategories listed above substantially outweigh the costs of compliance.

### Primary Antimony

We are proposing BPT requirements for the primary antimony subcategory, since BPT has not yet been promulgated. The technology basis for the BPT limitations is lime precipitation and sedimentation technology to remove metals and solids from combined wastewaters and to control pH. These technologies are not in-place at the one discharger in this subcategory. The pollutants specifically proposed for regulation at BPT are antimony, arsenic, lead, mercury, TSS, and pH.

Implementation of the proposed BPT limitations will remove annually an estimated 2,642 kg of toxic metals and 965 kg of TSS over estimated current discharge, which is equal to the raw waste load because no treatment is inplace. We project a capital cost of approximately \$34,200 and an annualized cost of approximately \$17,300 for achieving proposed BPT.

More stringent technology options were not selected for BPT since they require in-process changes and, therefore, are more appropriately considered under BAT.

### Bauxite Refining

EPA promulgated BPT effluent limitations for the bauxite refining subcategory on April 8, 1974 under Subpart A of 40 CFR Part 421. The promulgated BPT is based on zero discharge of process wastewater except for an allowance for net precipitation that falls within process wastewater impoundments. EPA is only proposing minor technical amendments to the existing BPT limitations. The technology basis of the existing BPT is impoundment and recycle.

# Primary Beryllium

We are proposing BPT requirements for the primary beryllium subcategory, since BPT has not yet been promulgated. The technology basis for the BPT limitations is lime precipation and sedimentation technology to remove metals and solids from combined wastewaters and to control pH and fluoride. This technology is already inplace at the one discharger in the subcategory. The pollutants specifically proposed for regulation at BPT are beryllium, chromium, copper, fluoride, TSS, and pH.

Because the one discharging facility in the primary beryllium subcategory already has the BPT technology in-place, and our data indicate that the technology is achieving the proposed BPT limitations, there will be no pollutant removal above the current discharge level and no incremental capital or annual costs.

More stringent technology options were not selected for BPT since they require in-process changes or end-ofpipe technologies less widely practiced in the subcategory, and, therefore, are more appropriately considered under BAT.

## Primary Boron

We are not proposing best practicable technology for existing direct dischargers for the primary boron subcategory since there are no existing direct dischargers.

#### Primary Cesium and Rubidium

We are not proposing BPT limitations for the primary cesium and rubidium subcategory because there are no existing direct dischargers.

# Primary and Secondary Germanium and Gallium

We are proposing BPT requirements for the primary and secondary germanium and gallium subcategory, since BPT has not yet been promulgated. Level A provisions are applicable to facilities which only reduce germanium dioxide in a hydrogen furnace and wash and rinse the germanium product in conjunction with zone refining. Level B provisions are applicable to all other facilities in the subcategory. The technology basis for both Levels A and B for the BPT limitations are lime precipitation and sedimentation technology to remove metals, fluoride and solids from combined wastewaters and to control pH. The pollutants specifically proposed for regulation at BPT are arsenic, lead, zinc, germanium, fluoride, TSS, and pH.

Although there are no existing direct dischargers in this subcategory, BPT is proposed for any existing zero discharger that elects to discharge at some point in the future. This action is deemed necessary because wastewaters from germanium and gallium operations which contain significant loadings of toxic pollutants are currently being disposed of in a RCRA permitted surface impoundment.

More stringent technology options were not selected for BPT since they require in-process changes or end-ofpipe technologies less widely practiced in the subcategory, and, therefore, are more appropriately considered under BAT. EPA is proposing a two tier regulatory scheme for this subcategory however the same technology apply to both levels at BPT.

The cost and specific removal data for this subcategory are not presented here because the data on which they are based have been claimed to be confidential. The Agency has determined that the benefits justify the costs for this subcategory.

## Secondary Indium

We are not proposing BPT limitations for the secondary indium subcategory since there are no existing direct dischargers.

#### Secondary Mercury

We are not proposing BPT limitations for the secondary mercury subcategory since there are no existing direct dischargers.

# Primary Molybdenum and Rhenium

We are proposing BPT requirements for the primary molybdenum and rhemum subcategory, since BPT has not yet been promulgated. The technology basis for the BPT limitations is lime precipitation and sedimentation technology to remove metals and solids from combined wastewaters and to control pH, and ammonia steam stripping preliminary treatment. These technologies are already in-place at one of the two direct dischargers in the subcategory. The pollutants specifically proposed for regulation at BPT are arsenic, lead, nickel, selenium, molybdenum, ammonia, TSS, and pH. As described previously, we also are proposing to add acid plants associated with primary molybdenum plants to those regulated by promulgated BPT limitations for the metallurgical acid plant subcategory.

Implementation of the proposed BPT limitations will remove annually an estimated 73,631 kg of toxic metals, 1,049 kg of molybdenum, 62,813 kg of ammonia, and 51,529 kg of TSS. While one of the discharging plants has the basic equipment components in-place to comply with BPT, we do not believe that either plant is currently achieving the BPT mass limitations.

The cost and specific removal data for this subcategory are not presented here because the data on which they are based have been claimed to be confidential. The Agency has determined that the benefits justify the costs for this subcategory.

More stringent technology options were not selected for BPT since they require in-process changes or end-ofpipe technologies less widely practiced in the subcategory, and, therefore, are more appropriately considered under BAT.

We are expanding the applicability of the existing BPT requirements established for the metallurgical acid plants subcategory to include the acid plants associated with primary molybdenum roasting operations. The technology basis for the existing BPT limitations is lime precipitation and sedimentation technology to remove metals and solids from combined wastewaters and to control pH. These technologies are already in-place at both of the dischargers included under the expanded applicability. The pollutants specifically proposed for regulation at BPT are cadmum, copper, lead, zinc, TSS, and pH.

Compliance with the existing BPT limitations for metallurgical acid plants by the two direct discharging primary molybdenum facilities which operate sulfuric acid plants will result in the removal of an estimated 8,026 kg of toxic metals, and 10,903 kg of TSS. While both plants have the equipment in-place to comply with BPT, we do not believe that the plants are currently achieving the proposed BPT limitations.

The cost and specific removal data for this subcategory are not presented here because the data on which they are , based have been claimed to be confidential. The Agency has determined that the benefits justify the costs for this subcategory.

# Secondary Molybdenum and Vanadium

We are proposing BPT requirements for the secondary molybdenum and vanadium subcategory, since BPT has not yet been promulgated. The technology basis for the BPT limitations is lime precipitation and sedimentation technology to remove metals and solids from combined wastewaters and to control pH, and ammonia steam stripping to remove ammonia. These technologies are already in-place at the one discharger in the subcategory. The pollutants specifically proposed for regulation at BPT are antimony, lead, nickel, molybdenum, ammonia, TSS, and pH.

Implementation of these proposed BPT limitations will remove annually an estimated 25,100 kg of toxic metals, and 74,000 kg of TSS.

The cost and specific removal data for this subcategory are not presented here because the data on which they are based have been claimed to be confidential. The Agency has determined that the benefits justify the costs for this subcategory.

More stringent technology options were not selected for BPT since they require in-process changes or end-ofpipe technologies less widely practiced in the subcategory, and, therefore, are more appropriately considered under BAT.

# Primary Nickel and Cobalt

We are proposing BPT requirements for the primary nickel and cobalt subcategory, since BPT has not yet been promulgated. The technology basis for the BPT limitations is lime precipitation and sedimentation technology to remove metals and solids from combined wastewaters and to control pH, and ammonia steam stripping to remove ammonia. Lime precipitation and sedimentation technology is already inplace at the one discharger in the subcategory. The pollutants specifically proposed for regulation at BPT are copper, nickel, cobalt, ammonia, TSS, and pH.

Implementation of the proposed BPT limitations will remove annually an estimated 241 kg of toxic metals.

The cost and specific removal data for this subcategory are not presented here

because the data on which they are based have been claimed to be confidential. The Agency has determined that the benefits justify the costs for this subcategory.

More stringent technology options were not selected for BPT since they require in-process changes or end-ofpipe technologies less widely practiced in the subcategory, and, therefore, are more appropriately considered under BAT.

# Secondary Nickel

We are not proposing BPT requirements for the secondary nickel subcategory, since there are no existing direct dischargers.

# Primary Precious Metals and Mercury

We are proposing BPT requirements for the primary precious metals and mercury subcategory, since BPT has not yet been promulgated. The technology basis for the BPT limitations is lime precipitation and sedimentation technology to remove metals and solids from combined wastewaters and to control pH, and oil skinming to remove oil and grease. These technologies are not in-place at the one discharger in this subcategory. The pollutants specifically proposed for regulation at BPT are arsenic, lead, mercury, silver, zinc, oil and grease, TSS, and pH.

Implementation of the proposed BPT limitations will remove annually an estimated 914 kg of toxic metals and 334 kg of TSS. We project a capital cost of \$27,500 and an annualized cost of \$9,000 for achieving proposed BPT limitations.

More stringent technology options were not selected for BPT since they require in-process changes or end-ofpipe technologies less widely practiced in the subcategory, and, therefore, are more appropriately considered under BAT.

## Secondary Precious Metals

We are proposing BPT requirements for the secondary precious metals subcategory, since BPT has not yet been promulgated. The technology basis for the BPT limitations is hydroxide precipitation and sedimentation technology to remove metals and solids from combined wastewaters and to control pH, ammonia steam stripping to remove ammonia, and cyanide precipitation to remove free and complex cyanıde. Chemiçal precipitation and sedimentation technology is already in-place at 20 of the plants in the subcategory including all three direct dischargers. One plant has cyanide precipitation in-place. The technology basis for steam stripping is discussed above. The pollutants

specifically proposed for regulation at BPT are copper, cyanide, zinc, ammonia, TSS, and pH.

Implementation of the proposed BPT limitations will remove annually an estimated 34,570 kg of toxic pollutants (which include 6.3 kg of cyanide), 490 kg of ammonia, and 11,200 kg of TSS.

The cost and specific removal data for this subcategory are not presented here because the data on which they are based have been claimed to be confidential. The Agency has determined that the benefits justify the costs for this subcategory.

More stringent technology options were not selected for BPT since they require in-process changes or end-ofpipe technologies less widely practiced in the subcategory, and, therefore, are more appropriately considered under BAT.

# Primary Rare Earth Metals

We are proposing BPT requirements for the primary rare earth metals subcategory, since BPT has not yet been promulgated. The technology basis for the BPT limitations is lime precipitation and sedimentation technology to remove metals and solids from combined wastewaters and to control pH. These technologies are already in-place at the one direct discharger in the subcategory. The pollutants specifically proposed for regulation at BPT are chromium, lead, nickel, TSS, and pH.

Compliance with of the proposed BPT limitations will remove annually an estimated 0.13 kg of toxic metals and 81.6 kg of TSS (no toxic organics would be removed). We project no capital or additional annual cost for achieving proposed BPT because the technology is already in-place at the one direct discharging facility in this subcategory.

More stringent technology options were not selected for BPT since they require in-process changes or end-ofpipe technologies less widely practiced in the subcategory. Therefore, they are more appropriately considered under BAT.

# Secondary Tantalum

We are proposing BPT requirements for the secondary tantalum subcategory, since BPT has not yet been promulgated. The technology basis for the BPT limitations is lime precipitation and sedimentation technology to remove metals and solids from combined wastewaters and to control pH. These technologies are already in-place at all three of the dischargers in the subcategory. The pollutants specifically proposed for regulation at BPT are copper, lead, nickel, zinc, TSS, and pH. Implementation of the proposed BPT limitations will remove annually an estimated 26,268 kg of toxic metals and 20,079 kg of TSS.

The cost and specific removal data for this subcategory are not presented here because the data on which they are based have been claimed to be confidential. The Agency has determined that the benefits justify the costs for this subcategory.

More stringent technology options were not selected for BPT since they require in-process changes or end-ofpipe technologies less widely practiced in the subcategory. Therefore, they are more appropriately considered under BAT.

# Primary and Secondary Tin

We are proposing BPT requirements for the primary and secondary tin subcategory, since BPT has not yet been promulgated. The technology basis for the BPT limitations is chemical precipitation and sedimentation technology to remove metals, fluoride, and solids from combined wastewaters and to control pH, with preliminary treatment consisting of cyanide precipitation and ammonia steam stripping. Chemical precipitation and sedimentation technology is already inplace at two of the three direct dischargers in the subcategory. The pollutants specifically proposed for regulation at BPT are antimony, cyanida, lead, nickel, tin, ammonia, fluoride, TSS, and pH.

Implementation of the proposed BPT limitations will remove annually an estimated 1,169 kg of toxic metals, 144 kg of cyanide, 237,220 kg of fluoride, and 58,560 kg of TSS.

More stringent technology options were not selected for BPT since they require in-process changes or end-ofpipe technologies not demonstrated in the subcategory, and, therefore, are more appropriately considered under BAT.

## Primary and Secondary Titanium

We are proposing BPT requirements for the primary and secondary titanium subcategory, since BPT has not yet been promulgated. The technology basis for the BPT limitations is lime precipitation and sedimentation technology to remove metals and solids from combined wastewaters and to control pH, and oil skimming preliminary treatment for streams with treatable concentrations of oil and grease. These technologies are already in place at two of the four direct dischargers in the subcategory. EPA is proposing a two tier regulatory scheme for this subcategory. However, the same technologies apply to both tiers at BPT. The pollutants specifically proposed for regulation at BPT are chromium, lead, nickel, thallium, fluoride, titanium, oil and grease, TSS, and pH.

Implementation of the proposed BPT limitations will remove annually an estimated 113 kg of toxic metals, 5,791 kg of titanium, and 58,864 kg of TSS. While two plants have the equipment inplace to comply with BPT, we do not believe that the plants are currently achieving the proposed BPT limitations. We project a capital cost of \$481,000 and annualized cost of \$330,000 for achieving proposed BPT in all plants.

More stringent technology options were not selected for BPT since they require in-process changes or end-ofpipe technologies less widely practiced in the subcategory, and, therefore, are more appropriately considered under BAT.

## Secondary Tungsten and Cobalt

We are proposing BPT requirements for the secondary tungsten and cobalt subcategory, since BPT has not yet been promulgated. The technology basis for the BPT limitations is lime precipitation and sedimentation technology to remove metals and solids from combined wastewaters and to control pH, oil skimming and ammonia steam stripping to remove ammonia. Lime precipitation and sedimentation technology is already in-place at three direct dischargers in the subcategory. The pollutants specifically proposed for regulation at BPT are copper, nickel, cobalt, ammonia, oil and grease, TSS, and pH.

Implementation of the proposed BPT limitations will remove annually an estimated 150,650 kg of toxic metals, and 108,700 kg of TSS.

The cost and specific removal data for this subcategory are not presented here because the data on which they are based have been claimed to be confidential. The Agency has determined that the benefits justify the costs for this subcategory.

More stringent technology options were not selected for BPT since they require in-process changes or end-ofpipe technologies less widely practiced in the subcategory, and, therefore, are more appropriately considered under BAT.

# Secondary Uranium

We are proposing BPT requirements for the secondary uranium subcategory, since BPT has not yet been promulgated. The technology basis for the BPT limitations is lime precipitation and sedimentation technology to remove metals and solids from combined wastewaters and to control pH. BPT also includes ammonia steam stripping. These technologies are already in-place at the one discharger in the subcategory. The pollutants specifically proposed for regulation at BPT are chromium, copper, nickel, ammonia, fluoride, uranium, TSS, and pH.

Implementation of the proposed BPT limitations will remove annually an estimated 1,220 kg of toxic metals, 12,000 kg of ammonia and 1,763 kg of TSS. While the one discharging plant has the equipment in-place to comply with BPT, we do not believe that the plant is currently achieving the proposed BPT limitations. We project capital and annual costs of \$28,600 and \$73,644 (1982 dollars) respectively for modifications to technology presently in-place at the discharging facility to achieve proposed BPT regulations.

More stringent technology options were not selected for BPT since they require in-process changes or end-ofpipe technologies less widely practiced in the subcategory. Therefore, they are more appropriately considered under BPT.

# Primary Zirconium and Hafnium

We are proposing BPT requirements for the primary zirconium and hafnium subcategory, since BPT has not yet been promulgated. The technology basis for the BPT limitations is lime precipitation and sedimentation technology to remove metals and solids from combined wastewaters and to control pH plus ammonia steam stripping, cyanide precipitation and barium chloride coprecipitation preliminary treatment of streams containing ammonia, cyanide or radium. Lime precipitation and sedimentation technology and ammonia steam stripping is already in-place at one discharger in the subcategory. The pollutants specifically proposed for regulation at BPT are chromium, cyanıde, lead, nıckel, ammonıa, radium (226), TSS, and pH.

Implementation of the proposed BPT limitations will remove annually an estimated 703 kg of toxic metals, and 281,882 kg of TSS.

The cost and specific removal data for this subcategory are not presented here because the data on which they are based have been claimed to be confidential. The Agency has determined that the benefits justify the costs for this subcategory.

More stringent technology options were not selected for BPT since they require in-process changes or end-ofpipe technologies less widely practiced in the subcategory, and, therefore, are more appropriately considered under BAT.

# XI. Best Available Technology (BAT) Effluent Limitations

The factors considered in assessing best available technology economically achievable (BAT) include the age of equipment and facilities involved, the process employed, process changes, nonwater quality environmental impacts (including energy requirements) and the costs of applying such technology (section 304(b)(2)(B) of the Clean Water Act). At a minimum, the BAT technology level represents the best economically achievable performance of plants of various ages, sizes, processes or other shared characteristics. As with BPT, where the Agency has found the existing performance to be uniformly madequate, BAT may be transferred from a different subcategory or category. BAT may include feasible process changes or internal controls, even when not in common industry practice.

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

Despite this expanded consideration of costs, the primary determinant of BAT is still pollutant removal capability. As a result of the Clean Water Act of 1977, the achievement of BAT has become the principal national means of controlling toxic water pollution.

The Agency has evaluated five major sets of technology options, set out in section VII, that might be considered BAT level technology. Each of these options would substantially reduce the discharge of toxic pollutants. These options are described in detail in section X of the General Development Document.

We also considered dry scrubbing as an in-process modification for BAT. This technology, however, generally was not sufficiently demonstrated for ronferrous metals subcategories subject to this rulemaking. The emissions from many of the manufacturing processes were found to contain hot particulate matter and acidic fumes. Emissions of this nature would tend to cause operational problems in dry scrubbers. The materials of construction would also be prohibitively expensive. Finally, we rejected dry scrubbing because the retrofit costs associated with implementation of this technology would also be prohibitively expensive.

As a means of evaluating the economic achievability of each of these options, the Agency developed estimates of the compliance costs. An estimate of capital and annual costs for each of the options was prepared for each subcategory as an aid in choosing the best BAT options. All compliance costs are based on March 1982 dollars.

The cost methodology has been described in detail in section III of this preamble. For most treatment technologies, standard cost literature sources and vendor quotations were used for module capital and annual costs. Data from several sources were combined to yield average or typical costs as a function of flow or other characterisfic design parameters. In a small number of modules, the technical literature was reviewed to identify the key design criteria, which were then used as a basis for vendor contacts. The resulting costs for individual pieces of equipment were combined to yield module costs. In either case, the cost data were coupled with flow data from each plant to establish system costs for each facility.

End-of-pipe filtration is demonstrated at 23 nonferrous metals plants in subcategories covered under nonferrous metals manufacturing phase I, and 2 plants covered under phase II in the primary nickel and cobalt and secondary precious metals subcategories. We are transferring endof-pipe filtration performance for the Primary Antimony, Primary Beryllium, Primary and Secondary Gemanium and Gallium, Primary Molybdenum and Rhenium, Secondary Molybdenum and Vanadium, Primary Nickel and Cobalt, Primary Precious Metals and Mercury, Secondary Precious Metals, Primary Rare Earth Metals, Secondary Tantalum, Primary and Secondary Tin, Primary and Secondary Titanium, Secondary **Tungsten and Cobalt, Secondary** Uranium, and Primary Zirconium and Hafnium subcategories of this proposed rulemaking from one nonferrous metals manufacturing plant and two porcelain enameling plants. As discussed in section IX of this preamble Summary of Generic Issues, this data base was selected because the raw wastewater among plants in nonferrous metals manufacturing phase II and in categories in the CMDB is similar. We believe that filtration will achieve the same effluent concentrations for nonferrous metals manufacturing wastewater as for the one nonferrous metals manufacturing and two porcelain enameling plants.

In-process flow reduction is an integral part of the proposed BAT in the primary beryllium, primary molybdenum and rhenium, primary precious metals and mercury, secondary precious metals, primary rare earth metals, primary and secondary titanium. secondary tungsten and cobalt, and primary zirconium and hafnium subcategories. Flow reduction is demonstrated in the category for wet air pollution control wastewater and contact cooling water. The demonstration status of in-process flow reduction and the level of recycle considered for this proposed rulemaking are discussed more fully in section IX of this preamble, Summary of Generic Issues. Flow reduction measures result in concentrating the pollutants present in wastewater. Treatment of a more concentrated stream allows a greater net removal of pollutants and a reduced flow may reduce the size of the treatment equipment and hence the cost of treatment. The Agency believes that the BAT technology based limitations proposed for the subcategories in this rulemaking are economically achievable.

#### Primary Antimony

Our proposed BAT limitations for this subcategory are based on lime precipitation and sedimentation (BPT technology) with the addition of filtration.

The pollutants specifically limited under BAT are antimony, arsenic, lead, and mercury. The toxic pollutants cadmium, copper and zinc were also considered for regulation because they were found at treatable concentrations in the raw wastewaters from this subcategory. These pollutants were not selected for specific regulation because they will be effectively controlled when the regulated toxic metals are treated to the levels achievable by the model BAT technology.

Implementation of the proposed BAT limitations would remove annually an estimated 2,644 kg of toxic pollutants, which is 1.3 kg of toxic metals over the estimated BPT discharge. Estimated capital cost for achieving proposed BAT is \$41,250, and annualized cost is \$21,183.

## Bauxite Refining

We are proposing today to make minor technical amendments to delete or correct references to FDF considerations under Part 125 and pretreatment references to Part 128. The existing BAT (promulgated on April 8, 1974 under Subpart A of 40 CFR Part 421) prohibits the discharge of process wastewater except for an allowance for net precipitation that falls within process wastewater impoundments.

Information has become available to the Agency that suggests the need for treatment of the red mud impoundment effluent to remove toxic organic pollutants not considered in the development of the promulgated limitations. In keeping with the emphasis of the Clean Water Act of 1977 on toxic pollutants, we have considered the discharge from process wastewater impoundments as a part of this rulemaking and are now considering the regulation of toxic pollutants.

Therefore, we also are soliciting comments on the need for BAT limitations on the net precipitation discharge from red-mud ponds based on activated carbon treatment to remove toxic organic pollutants. The pollutants being considered for control under BAT are 2-chlorophenol, phenol (GC/MS) and total phenols (4AAP). The limitations would be based on achieving a daily maximum concentration of 0.010 mg/l for each pollutant. The toxic pollutants 2,4,6-trichlorophenol, 4,6-dichlorophenol, 2-nitrophenol and 4-nitrophenol were also considered for possible regulation because they were found at treatable concentrations in the raw wastewaters from this subcategory. These pollutants are not presently being considered for regulation because they would be effectively controlled by the toxic organic limitations presently being considered.

The BAT limitations on the toxic pollutants under consideration would remove annually an estimated 4,835 kg of toxic pollutants from the estimated current discharge. Estimated capital cost for achieving proposed BAT is \$7.60 million, and annualized cost is \$2.98 million.

The Agency may promulgate concentration based BAT limitations as discussed above for net precipitation discharge. Accordingly the public should submit comments on this issue at this time. The Agency specifically invites comments on the need to modify the existing regulation. If EPA determines that a change in the existing regulation is necessary, EPA intends to promulgate the technical option discussed above.

# Primary Beryllium

Our proposed BAT limitations for this subcategory are based on lime precipitation and sedimentation (BPT technology), with the addition of inprocess wastewater reduction, and filtration. Flow reduction is based on 90 percent recycle of beryllium oxide calcining furnace wet air pollution control. Although the one beryllium plant currently generating beryllium oxide calcining furnace wet air pollution control wastewater does not practice recycle, recycle of similar streams is demonstrated extensively in other subcategories of the nonferrous metals manufacturing category.

The polllutants specifically limited under BAT are beryllium, chromum, copper, and fluoride.

Implementation of the proposed BAT limitations would remove annually an estimated 257 kg of toxic pollutants, which is 8 kg of toxic metals over the estimated BPT discharge. An intermediate option considered for BAT is flow reduction plus lime precipitation and sedimentation. This option would remove an estimated 7.3 kg of toxic metals over the estimated BPT discharge.

The costs and specific removal data for this subcategory are not presented here because the data on which they are based has been claimed to be confidential.

#### Primary Boron

We are not proposing limitations based on best available technology for existing direct dischargers for the primary boron subcategory since there are no existing direct dischargers.

### Primary Cesium and Rubidium

We are not proposing BAT limitations for the primary cesium and rubidium subcategory because there are no existing direct dischargers.

# Primary and Secondary Germanium and Gallium

We are proposing Level A BAT limitations for this subcategory based on lime precipitation and sedimentation (BPT technology) for plants that only reduce germanium oxide in a hydrogen furnance and then wash and rinse the germanium product in conjunction with zone refining. This is equivalent to BPT technology. Level B BAT limitations are proposed for all other facilities in this subcategory. The Level B effluent limitations are based on the addition of filtration.

The pollutants specifically limited under BAT are arsenic, lead, zinc, germanium and fluoride. The toxic pollutants antimony, cadmium, chromium, copper, nickel, selenium, silver and thallium were also considered for regulation because they were found at treatable concentrations in the raw wastewaters from this subcategory. These pollutants were not selected for specific regulation because they will be effectively controlled when the regulated toxic metals are treated to the levels achievable by the model BAT technology. The Agency considered applying the same technology levels to this entire subcategory but decided to propose this two tiered regulatory scheme because there was little additional pollutant removal from the Level A wastewater streams when treated by the added Level B technology.

Although there are no existing direct dischargers in this subcategory, BAT is proposed for any existing zero discharger who elects to discharge at some point in the future. This action was deemed necessary because wastewaters from germanium and gallium operations which contain significant loadings of toxic pollutants are currently being disposed of in a RCRA permitted surface impoundment.

It is estimated that Level A plants in this subcategory would remove 305 kg of toxic metals annually. It is also estimated that Level B plants in this subcategory would remove 548 kg of toxic metals annually.

The costs and specific removal data for this subcategory are not presented here because the data on which they are based has been claimed to be confidential.

### Secondary Indium

We are not proposing BAT limitations for the secondary indium subcategory since there are no existing direct dischargers.

# Secondary Mercury

We are not proposing BAT limitations for the secondary mercury subcategory since there are no existing direct dischargers.

### Primary Molybdenum and Rhenium

Our proposed BAT limitations for this subcategory are based on (BPT technology) preliminary treatment of ammonia steam stripping, end-of-pipe treatment consisting of lime precipitation and sedimentation, with the addition of in-process wastewater reduction, and filtration. Flow reductions are based on 90 percent recycle of scrubber liquor, a rate demonstrated by one of the two direct discharger plants.

The pollutants specifically limited under BAT are arsenic, lead, molybdenum, nickel, selenium, and ammonia. The toxic pollutants chromium, copper and zinc were also considered for regulation because they were found at treatable concentrations in the raw wastewaters from this subcategory. These pollutants were not selected for specific regulation because they will be effectively controlled when the regulated toxic metals are treated to the levels achievable by the model BAT technology.

Implementation of the proposed BAT limitations would remove annually an estimated 73,655 kg of toxic metals, which is 24 kg of toxic metals greater than the estimated BPT removal. No additional ammonia is removed at BAT.

An intermediate option considered for BAT is preliminary treatment with ammonia steam stripping followed by end-of-pipe treatment consisting of chemical precipitation and sedimentation with the addition of flow reduction. This option would remove an estimated 13 kg of toxic metals more than the estimated BPT discharge.

The costs and specific removal data for this subcategory are not presented here because the data on which they are based has been claimed to be confidential.

We are expanding the applicability of the existing BAT limitations for metallurgical acid plants to include acid plants associated with primary molybdenum roasting operations. The existing BAT limitations are based on the BPT technology (lime precipitation and sedimentation), in-process wastewater reduction, sulfide precipitation and filtration. Flow reduction are based on 90 percent recycle of scrubber liquor.

Compliance with the BAT limitations for the existing metallurgical acid plants subcategory by the two direct discharging primary molybdenum facilities which operate sulfuric acid plants will result in the annual removal of an estimated 8,245 kg of toxic pollutants.

# Secondary Molybdenum and Vanadium

Our proposed BAT limitations for this subcategory are based on preliminary treatment consisting of ammonia steam stripping followed by end-of-pipe treatment consisting of lime precipitation and sedimentation (BPT technology) and filtration.

The pollutants specifically limited under BAT are antimony, lead, molybdenum, nickel, and ammonia. The toxic pollutants arsenic, beryllium, cadmium, chromium and zinc were also considered for regulation because they were found at treatable concentrations in the raw wastewaters from this subcategory. These pollutants were not selected for specific regulation because they will be effectively controlled when the regulated toxic metals are treated to the levels achievable by the model BAT technology.

Implementation of the proposed BAT limitations would remove annually an estimated 25,190 kg of toxic pollutants. which is 80 kg of toxic metals greater than the estimated BPT removal.

The costs and specific removal data for this subcategory are not presented here because the data on which they are based has been claimed to be confidential.

# Primary Nickel and Cobalt

Our proposed BAT limitations for this subcategory are based on preliminary treatment of ammonia steam stripping followed by end-of-pipe treatment consisting of lime precipitation and sedimentation (BPT technology), and filtration. Filters are presently utilized by the one plant in this subcategory.

We are proposing filtration as part of the BAT technology because this technology is demonstrated in the primary nickel and cobalt category (the one discharger in this subcategory presently has a filter, and a total of 25 facilities in eight nonferrous metals manufacturing subcategories currently have filters), and results in additional removals of toxic metals. In addition, filtration adds reliability to the treatment system by making it less susceptible to operator error and to sudden changes in raw wastewater flows and concentrations.

The pollutants specifically limited under BAT are cobalt, copper, nickel, and ammonia. The toxic pollutant zinc was also considered for regulation because it was found at treatable concentrations in the raw wastewaters from this subcategory. This pollutant was not selected for specific regulation because it will be effectively controlled when the regulated toxic metals are treated to the levels achievable by the model BAT technology.

Implementation of the proposed BAT limitations would remove annually an estimated 246 kg of toxic metals, which is 5 kg of toxic metals greater than the estimated BPT removal.

The costs and specific removal data for this subcategory are not presented here because the data on which they are based has been claimed to be confidential.

## Secondary Nickel

We are not proposing BAT for the secondary nickel subcategory since there are no existing direct dischargers.

#### Primary Precious Metals and Mercury

Our proposed BAT limitations for this subcategory are based on preliminary treatment consisting of oil skimming and end-of-pipe treatment consisting of lime precipitation and sedimentation (BPT technology), and filtration. BAT also includes flow reduction. The pollutants specifically limited under BAT are arsenic, lead, mercury, silver, and zinc. The toxic pollutants cadmium, chromium, copper, nickel and thallium were also considered for regulation because they were found at treatable concentrations in the raw wastewaters from this subcategory. These pollutants were not selected for specific regulation because they will be effectively controlled when the regulated toxic metals are treated to the levels achievable by the model BAT technology.

Implementation of the proposed BAT limitations would remove annually an estimated 914.5 kg of toxic pollutants, which is 0.5 kg of toxic metals greater than the estimated BPT removal. No additional oil and grease is removed at BAT. Estimated capital cost for achieving proposed BAT is \$30,000, and annualized cost is \$10,000.

## Secondary Precious Metals

Our proposed BAT limitations for this subcategory are based on preliminary treatment consisting of cyanide precipitation and ammonia steam stripping and end-of-pipe treatment consisting of chemical precipitation and sedimentation (BPT technology) with the addition of in-process wastewater flow reduction, and filtration. Flow reductions are based on recycle of scrubber effluent. Twenty-one of the 29 existing plants currently have scrubber liquor recycle rates of 90 percent or greater. Filters also are presently utilized by one plant in the subcategory.

The pollutants specifically limited under BAT are copper, cyanide, zinc, and ammonia. The toxic pollutants antimony, arsenic, cadmium, chromium, lead, nickel, selenium, silver and thallium were also considered for regulation because they were found at treatable concentrations in the raw wastewaters from this subcategory. These pollutants were not selected for specific regulation because they will be effectively controlled when the regulated toxic metals are treated to the levels achievable by the model BAT technology.

Implementation of the proposed BAT limitations would remove annually an estimated 34,580 kg of toxic pollutants, which is 10 kg of toxic pollutants greater than the estimated BPT removal. No additional ammonia or cyanide is removed at BAT.

An intermediate option considered for BAT is flow reduction plus preliminary treatment consisting of cyanide precipitation, ammonia steam stripping and end-of-pipe treatment consisting of chemical precipitation and sedimentation. This option would remove an estimated 6.3 kg of toxic metals more than the estimated BPT removal.

The costs and specific removal data for this subcategory are not presented here becaue the data on which they are based has been claimed to be confidential.

## Primary Rare Earth Metals

Our proposed BAT limitations for this subcategory are based on lime precipitation and sedimentation (BPT technology) with the addition of inprocess flow reduction and filtration. Flow reduction is based on 90 percent recycle of scrubber effluent. Activated carbon absorption technology is proposed to control the discharge of hexachlorobenzene which is not effectively removed by existing treatment in the subcategory. Activated carbon technology is transferred from the iron and steel category where it is a demonstrated technology for removal of toxic organics.

The pollutants specifically limited under BAT are hexachlorobenzene, chromium, lead, and nickel. The toxic pollutants benzene, arsenic, cadmium, copper, selenium, silver, thallium and zinc were also considered for regulation because they were found at treatable concentrations in the raw wastewaters from this subcategory. These pollutants were not selected for specific regulation because they will be effectively controlled when the regulated toxic pollutants are treated to the levels achievable by the model BAT technology.

Implementation of the proposed BAT limitations would remove annually an estimated 18.3 kg of toxic pollutants (14.9 kg of toxic organics and 3.4 kg of toxic metals) and 198 kg of suspended solids more than the estimated BPT removal. An intermediate option considered for BAT is lime precipitation and sedimentation with the addition of in-process flow reduction and filtration. This option would remove an estimated 3.4 kg of toxic metals more than the estimated BPT removal. No toxic organics would be removed.

The costs and specific removal data for this subcategory are not presented here because the data on which they are based has been claimed to be confidential.

# Secondary Tantalum

Our proposed BAT limitations for this subcategory are based on lime precipitation and sedimentation (BPT technology) with the addition of filtration.

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The pollutants specifically limited under BAT are copper, lead, nickel, and zinc. The toxic pollutants antimony, beryllium; cadmium, chromium and silver were also considered for regulation because they were found at treatable concentrations in the raw wastewaters from this subcategory. These pollutants were not selected for specific regulation because they will be effectively controlled when the regulated toxic metals are treated to the levels achievable by the model BAT technology.

Implementation of the proposed BAT limitations would remove annually an estimated 26,273 kg of toxic metals, which is 4.8 kg of toxic metals more than the estimated BPT removal.

The costs and specific removal data for this subcategory are not presented here because the data on which they are based has been claimed to be confidential.

# Primary and Secondary Tin

Our proposed BAT limitations for this subcategory are based on preliminary treatment consisting of ammonia steam stripping and cyanide precipitation when required, and end-of-pipe treatment consisting of chemical precipitation and sedimentation, and polishing filtration.

The pollutants specifically limited under BAT are antimony, cyanide, lead, nickel, tin, ammonia, and fluoride. The toxic pollutants arsenic, cadmium, chromium, copper, selenium, silver, thallium and zinc were also considered for regulation because they were found at treatable concentrations in the raw wastewaters from this subcategory. These pollutants were not selected for specific regulation because they will be effectively controlled when the regulated toxic metals are treated to the levels achievable by the model BAT technology.

Implementation of the proposed BAT limitations would remove annually an estimated 1,045 kg of toxic metals, which is 91 kg of toxic metals over the estimated BPT discharge. No additional fluoride is removed at BAT. The costs and specific removal data for this subcategory are not presented here because the data on which they are based has been claimed to be confidential.

# Primary and Secondary Titanium

We are proposing Level A BAT limitations for titanium plants which do not practice electrolytic recovery of magnesium and which use vacuum distillation instead of leaching to purify titanium sponge as the final product are based on lime precipitation,

sedimentation, and oil skimming (BPT technology) plus in-process wastewater flow reduction. Level B BAT limitations are proposed for all other titanium plants are based on lime precipitation. sedimentation, and oil skimming pretreatment where required (BPT technology) plus flow reduction, and filtration. Flow reduction is based on SD percent recycle of scrubber effluent through holding tanks and 90 percent recycle of casting contact cooling water through cooling towers. The Agency considered applying the same technology levels to this entire subcategory but decided to propose this two tiered regulatory scheme because there was little additional pollutant removal from the Level A wastewater streams when treated by the added Level B technology.

The pollutants specifically limited under BAT are chromium, lead, nickel, thallium, titanium, and fluoride. The toxic pollutants antimony, cadmium, copper and zinc were also considered for regulation because they were found at treatable concentrations in the raw wastewaters from this subcategory. These pollutants were not selected for specific regulation because they will be adequately treated when the regulated toxic metals are treated to the levels achievable by the model BAT technology.

There are currently no direct discharging Level A plants in this subcategory. It is estimated that if the four existing direct discharging Level B plants in this subcategory became Level A dischargers they would incur a capital cost of approximately \$641,000 and an annualized cost of \$325,000; 135 kg of toxic pollutants would be removed.

Implementation of the proposed Level B BAT limitations would remove annually an estimated 298 kg of toxic pollutants. Estimated capital cost for achieving proposed BAT is \$1,030.000, and annualized cost is \$585,000.

## Secondary Tungsten and Cobalt

Our proposed BAT limitations for this subcategory are based on lime precipitation and sedimentation (BPT technology) ammonia steam stripping plus in-process wastewater reduction, and filtration. Flow reductions are based on 90 percent recycle of scrubber effluent, which is the rate reported by the only existing plant with a scrubber.

The pollutants specifically limited under BAT are cobalt, copper, nickel, and ammonia. The toxic pollutants arsenic, cadmium, chromium, lead, silver and zinc were also considered for regulation because they were found at treatable concentrations in the raw wastewaters from this subcategory. These pollutants were not selected for specific regulation because they will be effectively controlled when the regulated toxic metals are treated to the levels achievable by the model BAT technology.

Implementation of the proposed BAT limitations would remove annually an estimated 150,700 kg of toxic pollutants.

The costs and specific removal data for this subcategory are not presented here because the data on which they are based has been claimed to be confidential.

The intermediate option we considered for BAT is flow reduction plus ammonia steam stripping and chemical precipitation and sedimentation. This option would remove an estimated 26 kg of toxic metals over the estimated BPT discharge.

## Secondary Uranium

Our proposed BAT limitations for this subcategory are based on ammonia steam stripping and lime precipitation and sedimentation (BPT technology), plus filtration.

The pollutants specifically limited under BAT are chromium, copper, nickel, ammonia, uranium and fluoride. The toxic pollutants arsenic, cadmium, lead, selenium, silver and zinc were also considered for regulation because they were found at treatable concentrations in the raw wastewaters from the subcategory. These pollutants were not selected for specific regulation because they will be effectively controlled when the regulated toxic metals are treated to the levels achievable by the model BAT technology.

Implementation of the proposed BAT limitations would remove annually an estimated 1,304 kg of toxic metals and 12,000 kg of ammonia. Estimated capital cost for achieving proposed BAT is \$54,312, and annualized cost is \$36,452 (1982 dollars).

# Primary Zirconium and Hafnium

Our proposed Level A BAT limitations for plants which only produce zirconium or zirconium-nickel alloys by magnesium reduction of ZrO2 are based on barium chloride coprecipitation, cyanide precipitation, ammonia stream stripping and chemical precipitation and sedimentation (BPT technology), plus improcess wastewater flow reduction. Level B limitations apply to all other plants in the subcategory. The proposed Level B BAT limitations are based on barium chloride coprecipitation, cyanide precipitation, ammonia stream stripping and chemical precipitation and

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sedimentation (BPT technology), plus flow reduction, and filtration.

The achievable concentration for ammonia steam stripping is based on iron and steel manufacturing category data. Flow reductions are based on 90 percent recycle of scrubber effluent. The Agency considered applying the same technology levels to this entire subcategory but decided to propose this two tiered regulatory scheme because there was little additional pollutant removal from the Level A wastewater streams when treated by the added Level B technology.

The pollutants specifically limited under BAT are chromium, cyanide, lead, nickel, radium (226) and ammonia. The toxic pollutants cadmium, thallium and zinc were also considered for regulation because they were found at treatable concentrations in the raw wastewaters from this subcategory. These pollutants were not selected for specific regulation because they will be effectively controlled when the regulated toxic metals are treated to the levels achievable by the model BAT technology.

There are currently no level A direct discharging plants in this subcategory.

The costs and specific removal data for this subcategory are not presented here because the data on which they are based has been claimed to be confidential.

# XII. New Source Performance Standards (NSPS)

The basis for new source performance standards (NSPS) under section 306 of the Act is the best available demonstrated technology. New plants have the opportunity to design and use the best and most efficient nonferrous metals manufacturing processes and wastewater treatment technologies, without facing the added costs and restrictions encountered in retrofitting an existing plant. Therefore, Congress directed EPA to consider the best demonstrated process changes, in-plant controls, and end-of-pipe treatment technologies which reduce pollution to the maximum extent feasible.

The Agency has considered four major sets of technology options for this phase of nonferrous metals manufacturing which might be applied at the BDT level discussed in section VII. Each of these options would substantially reduce the discharge of toxic pollutants. These options are described in detail in Section X of the General Development Document. The option selected for each subcategory and the underlying rationale are presented below.

We are transferring lime precipitation and sedimentation technology and performance for the primary boron, primary cesium and rubidium. secondary indium, secondary mercury and secondary nickel subcategories from aluminum forming, copper forming, coil coating, battery manufacturing and porcelain enameling plants. This technology is not demonstrated on nonferrous metals manufacturing phase II process wastewater discharges in these subcategories. While lime precipitation and sedimentation is not demonstrated in these subcategories, we believe that it is transferable because of its widespread demonstration in this (the nonferrous metals manufacturing) category and by the categories considered in the CMDB. The raw wastewater characteristics of the primary boron, primary cesium and rubidium, secondary indium, secondary mercury and secondary nickel subcategories are similar to those found in this category. Likewise, the raw wastewater characteristics of these phase II subcategories are similar to those for the plants in the combined metals data base (see Section IX of this preamble). We believe that the technology when applied to wastewater in these phase II subcategories will achieve the same effluent concentration as plants in the CMDB.

We are transferring filtration technology for the primary cesium and rubidium, secondary indium, secondary mercury and secondary nickel subcategories from one nonferrous metals manufacturing phase I plant and two porcelain enameling plants. This technology is not demonstrated on nonferrous manufacturing phase II process wastewater discharges in these subcategories. While filtration is not demonstrated in these subcategories, we believe that it is transferrable because of its demonstration in this category. The raw wastewater characteristics of the primary cesium and rubidium. secondary indium, secondary mercury and secondary nickel subcategories are similar to those found in the other subcategories in the nonferrous metals manufacturing category. Likewise, the raw wastewater characteristics of these phase II subcategories are similar to those for plants in the data base used for filtration performance (see section IX of this preamble). We believe that this technology when applied to wastewater in these phase II subcategories will achieve the same effluent concentrations as the plants used to ·establish filtration performance.

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## Primary Antimony

We are proposing that NSPS be equal to BAT. Our review of the subcategory indicates that no new demonstrated technologies that improve on BAT technology exist. We do not believe that new plants could achieve any flow reduction beyond the allowances proposed for BAT. Because NSPS is equal to BAT we believe that the proposed NSPS will not pose a barrier to the entry of new plants into this subcategory.

## Bauxite Refining

As discussed under BAT, we are soliciting comment on the achievability of NSPS equivalent to the BAT limitations. The standards we are considering would require that new bauxite plants achieve a maximum daily concentration of 0.010 mg/1 for 2chlorophenol, phenol, and phenols (4AAP). Because the NSPS being considered is equal to the BAT we are considering, we believe that the proposed NSPS will not pose a barrier to the entry of new plants into this subcategory.

## Primary Beryllium

We are proposing that NSPS be equal to BAT. Our review of the subcategory indicates that no new demonstrated technologies that improve on BAT technology exist. We do not believe that new plants could achieve any flow reduction beyond the allowances proposed for BAT. Because NSPS is equal to BAT we believe that the proposed NSPS will not have a detrimental impact on the entry of new plants into this subcategory.

## Primary Boron

Our proposed NSPS limitations for this subcategory are based on lime precipitation and sedimentation technology. This technology is fully demonstrated in many nonferrous metals subcategories and would be expected to perform at the same level in this subcategory.

The pollutants specifically limited under NSPS are boron, lead, nickel, TSS, and pH. The toxic pollutants cadmium, chromium, thallium and zinc were also considered for regulation because they are present at treatable concentrations in the raw wastewaters from this subcategory. These pollutants were not selected for specific regulation because they will be effectively controlled when the regulated toxic metals are treated to the levels achievable by the model technology.

The costs and specific removal data for this subcategory are not presented here because the data on which they are based has been claimed to be confidential. We believe that the proposed NSPS limitations are achievable, and that they are not a barrier to entry of new plants into this subcategory.

### Primary Cesium and Rubidium

Our proposed NSPS for the primary cesium and rubidium subcategory are based on lime precipitation, sedimentation, and filtration technology.

The pollutants and pollutant parameters specifically limited under NSPS are lead, thallium, zınc, TSS, and pH. The toxic pollutants antimony, arsenic, beryllium, cadmium, chromium, copper, mckel and silver were also considered for regulation because they are present at treatable concentrations in the raw wastewaters from this subcategory. These pollutants were not selected for specific regulation because they will be effectively controlled when the regulated toxic metals are treated to the levels achievable by the model technology.

The costs and specific removal data for this subcategory are not presented here because the data on which they are based has been claimed to be confidential. We believe the proposed NSPS is economically achievable, and that they are not a barrier to entry of new plants into this subcategory.

# Primary and Secondary Germanium and Gallium

We are proposing that NSPS be equal to BAT. Our review of the subcategory indicates that no new demonstrated technologies that improve on BAT technology exist. We do not believe that new plants could achieve any flow reduction beyond the allowances proposed for BAT. Because NSPS is equal to BAT we believe that the proposed NSPS will not have a detrimental impact on the entry of new plants into this subcategory.

## Secondary Indium

We are proposing that NSPS for the secondary indium subcategory be based on lime precipitation, sedimentation. (the same model technology as PSES) and polishing filtration. The pollutants and pollutant parameters specifically limited under NSPS are cadmum, lead, zinc, indium, total suspended solids and pH. The toxic pollutants chromium, nickel, selenium, silver and thallium were also considered for regulation because they are present at treatable concentrations in the raw wastewaters from this subcategory. These pollutants were not selected for specific regulation because they will be effectively

controlled when the regulated toxic metals are treated to the levels achievable by the model technology.

The costs and specific removal data for this subcategory are not presented here because the data on which they are based has been claimed to be confidential. We believe the proposed NSPS is economically achievable, and that they do not pose a barrier to entry of new plants into this subcategory.

#### Secondary Mercury

Our proposed NSPS for this subcategory are based on lime precipitation, sedimentation, and filtration. This technology is fully demonstrated in many nonferrous metals manufacturing subcategories and would be expected to perform at the same level in this subcategory.

The pollutants specifically limited under NSPS are lead, mercury, TSS, and pH. The toxic pollutants arsenic, cadmium, copper, silver and zinc were also considered for regulation because they are present at treatable concentrations in the raw wastewaters from this subcategory. These pollutants were not selected for specific regulation because they will be effectively controlled when the regulated toxic metals are treated to the levels achievable by the model technology.

We believe the proposed NSPS is economically achievable, and that they are not a barrier to entry of new plants into this subcategory.

## Primary Molybdenum and Rhenium

We are proposing that NSPS be equal to BAT. Our review of the subcategory indicates that no new demonstrated technologies that improve on BAT technology exist. We do not believe that new plants could achieve any flow reduction beyond the allowances proposed for BAT. Because NSPS is equal to BAT we believe that the proposed NSPS will not have a detrimental impact on the entry of new plants into this subcategory.

We are expanding the applicability of the existing NSPS regulation for the metallurgical acid plants subcategory to include acid plants associated with primary molybdenum roasting operations. We do not believe that this expanded applicability will have a detrimental impact on the entry of new plants into this subcategory.

# Secondary Molybdenum and Vanadium

We are proposing that NSPS be equal to BAT. Our review of the subcategory indicates that no new demonstrated technologies that improve on BAT technology exist. We do not believe that new plants could achieve any flow reduction beyond the allowances proposed for BAT. Because NSPS is equal to BAT we believe that the proposed NSPS will not pose a barner to the entry of new plants into this subcategory.

## Primary Nickel and Cobalt

We are proposing that NSPS be equal to BAT. Our review of the subcategory indicates that no new demonstrated technologies that improve on BAT technology exist. We do not believe that new plants could achieve any flow reduction beyond the allowances proposed for BAT. Because NSPS is equal to BAT we believe that the proposed NSPS will not pose a barrier to the entry of new plants into this subcategory.

#### Secondary Nickel

We are proposing that NSPS be equivalent to PSES. Our review of the subcategory indicates that no new demonstrated technologies that improve on PSES technology exist. We do not believe that new plants could achieve any flow reduction beyond the allowances proposed for BAT. Because NSPS is equal to PSES we believe that the proposed NSPS will not pose a barrier to the entry of new plants into this subcategory.

## Primary Precious Metals and Mercury

We are proposing that NSPS be equal to BAT. Our review of the subcategory indicates that no new demonstrated technologies that improve on BAT technology exist. We do not believe that new plants could achieve any flow reduction beyond the allowances proposed for BAT. Because NSPS is equal to BAT we believe that the proposed NSPS will not have a detrimental impact on the entry of new plants into this subcategory.

# Secondary Precious Metals

We are proposing that NSPS be equal to BAT, except for furnace air pollution control, which we are proposing as zero discharge. Except for furnace air pollution control, our review of the industry indicates that no new demonstrated technologies exist that improve on BAT technology. Zero discharge for furnace air pollution control is based on dry scrubbing, which is demonstrated at 11 out of 16 plants with furnace air pollution control. Cost for dry scrubbing air pollution control in a new facility is no greater than the cost for wet scrubbing which was the basis for BAT cost estimates. We believe that the proposed NSPS is economically achievable, and that they are not a

barrier to entry of new plants into this subcategory.

## Primary Rare Earth Metals

We are proposing that NSPS be equal to BAT. Our review of the subcategory indicates that no new demonstrated technologies that improve on BAT technology exist. We do not believe that new plants could achieve any flow reduction beyond the allowances proposed for BAT. Because NSPS is equal to BAT we believe that the proposed NSPS will not have a detrimental impact on the entry of new plants into this subcategory.

#### Secondary Tantalum

We are proposing that NSPS be equal to BAT. Our review of the subcategory indicates that no new demonstrated technologies that improve on BAT technology exist. We do not believe that new plants could achieve any flow reduction beyond the allowances proposed for BAT. Because NSPS is equal to BAT we believe that the proposed NSPS will not pose a barrier to the entry of new plants into this subcategory.

# Primary and Secondary Tin

We are proposing that NSPS be equal to BAT. Our review of the subcategory indicates that no new demonstrated technologies that improve on BAT technology exist. We do not believe that new plants could achieve any flow reduction beyond the allowances proposed for BAT. Because NSPS is equal to BAT we believe that the proposed NSPS will not pose a barrier to the entry of new plants into this subcategory.

## Primary and Secondary Titanium

We are proposing that NSPS be equal to BAT plus flow reduction technology with additional flow reduction for four streams. Zero discharge is proposed for chip crushing, sponge crushing and screening, and scrap milling wet air pollution control wastewater based on dry scrubbing. Zero discharge is also proposed for chlorine liquefaction wet air pollution control based on byproduct recovery of scrubber liquor as hypochlorous acid. Cost for dry scrubbing air pollution control in a new facility is no greater than the cost for wet scrubbing which was the basis for BAT cost estimates. We believe that the proposed NSPS is economically achievable and that it will not pose a barrier to the entry of new plants into this subcategory.

## Secondary Tungsten and Cobalt

We are proposing that NSPS be equal to BAT. Our review of the subcategory indicates that no new demonstrated technologies that improve on BAT technology exist. We do not believe that new plants could achieve any flow reduction beyond the allowances proposed for BAT. Because NSPS is equal to BAT we believe that the proposed NSPS will not pose a barrier to the entry of new plants into this subcategory.

#### Secondary Uranium

We are proposing that NSPS be equal to BAT. Our review of the subcategory indicates that no new demonstrated technologies that improve on BAT technology exist. We do not believe that new plants could achieve any flow reduction beyond the allowances proposed for BAT. Because NSPS is equal to BAT we believe that the proposed NSPS will not pose a barrier to the entry of new plants into this subcategory.

## Primary Zirconium and Hafnium

We are proposing that NSPS be equal to BAT. Our review of the subcategory indicates that no new demonstrated technologies that improve on BAT technology exist. We do not believe that new plants could achieve any flow reduction beyond the allowances proposed for BAT. Because NSPS is equal to BAT we believe that the \_ proposed NSPS will not pose a barrier to the entry of new plants into this subcategory.

## XIII. Pretreatment Standards for Existing Sources (PSES)

Section 307(b) of the Act requires EPA to promulgate pretreatment standards for existing sources (PSES) to prevent the discharge of pollutants which pass through, interfere with, or are otherwise incompatible with the operation of POTW. These standards must be achieved within three years of promulgation. The legislative history of the 1977 Act indicates that pretreatment standards are to be technology based, generally analogous to BAT for direct dischargers. (Conference Report 95-830 at 87; Reprinted in Comm. on Environmental and Public Works, 95th Cong. 2d Sess., A Legislative History of the Clean Water Act of 1977, Vol. 3 at 272.)

Before proposing pretreatment standards, the Agency examines whether the pollutants discharged by the industry pass through the POTW or interfere with the POTW operation or its chosen sludge disposal practices. In

determining whether pollutants pass through the Agency compares the percentage of a pollutant removed by a well-operated POTW, achieving secondary treatment, with the percentage removed by indirect dischargers applying the best available technology economically achievable. A pollutant is deemed to pass through the POTW when the average percentage removed nationwide by a well-operated POTW meeting secondary treatment requirements, is less than the percentage removed by dischargers complying with BAT level effluent limitations guidelines for that pollutant. (See generally, 46 FR at 9415-16 (January 28, 1981).)

This definition of pass through satisfies two competing objectives set by Congress: (1) That standards for indirect dischargers be equivalent to standards for direct dischargers, while at the same time, (2) that the treatmentcapability and performance of the POTW be recognized and taken into account in regulating the discharge of pollutants from indirect dischargers.

The Agency compares percentage removal rather than the mass or concentration of pollutants discharged because the latter would not take into account the mass of pollutants discharged to the POTW from nonindustrial sources nor the dilution of the pollutants in the POTW effluent to lower concentrations due to the addition of large amounts of non-industrial wastewater. We have data to indicate that pollutants are removed to a degree when treated in a POTW. The percentage of removal in POTW for selected pollutants is antimony-0: arsenic-20; cadmium-38; chromium-18; copper-58; cyanide-52; lead-48; mercury-69; nickel-19; selenium-0; silver-66; zinc-65; hexachlorobenzene-12, ammonia-40 and fluoride—0. These removal levels are used in determining pass through of pollutant.

There were no data concerning POTW removals for beryllium, boron, cobalt, germanium, indium, molybdenum, radium 226, thallium, tin, titanium, and uranium, to compare with our estimates of in-plant treatment. Removal of these pollutants is solubility related. Since the removal of metal pollutants for which data are available is also solubility related, EPA believes that these pollutants may pass through a POTW We have assumed that these metals pass through a POTW in today's notice (zero removal); however, we formally solicit comments and data on whether these pollutants do pass through POTW and on actual POTW removal performance. Where EPA has regulated

these pollutants they are a major pollutant generated in a substantial mass in the subcategory.

EPA is proposing mass-based PSES for eight of the 20 discharging subcategories to assure the efficient reduction benefits associated with flow reductions in those subcategories.

We are transferring lime preciptation and sedimentation technology and its performance for the secondary indium and secondary nickel subcategories from aluminum forming, copper forming, coil coating, battery manufacturing and porcelam enameling plants. This technology is not demonstrated m existing plants in these subcategories. While lime precipitation and sedimentation is not demonstrated in these subcategories, we believe that it is transferrable because of its widespread demonstration in this category. The raw wastewater characteristics of secondary indium and secondary nickel subcategories are similar to those found in this category. Likewise, the raw wastewater characteristics of the phase II subcategories are similar to those for plants in the CMDB (see section IX of this preamble). We believe that the technology when applied to wastewater in these phase II subcategories will achieve the same effluent

concentrations as plants in the CMDB. We are transferring filtration technology for the secondary nickel subcategory from one nonferrous metals manufacturing plant and two porcelain enameling plants. This technology is not demonstrated on existing secondary nickel process wastewater discharges. While filtration is not demonstrated in this subcategory, we believe that it is transferrable because it is demonstrated in the nonferrous metals manufacturing category. The raw wastewater characteristics of the secondary nickel subcategory are similar to those found

In the other nonferrous metals manufacturing subcategories and in the plants used for establishing filtration performance (See section IX of this preamble). We believe that this technology when applied to secondary nickel wastewater will achieve the same effluent concentrations as the plants used to establish filtration performance.

#### Primary Antimony

We are not proposing PSES limitations for the primary antimony subcategory because there are no existing indirect dischargers.

#### Bauxite Refining

We are not proposing PSES limitations for the bauxite refining subcategory because there are no existing indirect dischargers.

#### Primary Beryllium

We are not proposing pretreatment standards for existing sources for the primary beryllium subcategory since there are no indirect dischargers.

#### Primary Boron

We are not proposing pretreatment standards for existing sources for the primary boron subcategory since there are no existing indirect dischargers.

## Primary Cesium and Rubidium

We are not proposing FSES for the primary cesium and rubidium subcategory because there are no existing indirect dischargers.

## Primary and Secondary Germanium and Gallium

We are proposing two levels of PSES for this subcategory. The first level, A, consists of lime precipitation and sedimentation. Level A applies to plants which only reduce germanium dioxide to metal and practice zone refining and acid washing and rinsing. These plants only have one waste stream—acid wash and rinse water. The second level, B, consists of lime precipitation, sedimentation, and filtration. Level B applies to all other plants in the subcategory.

The pollutants controlled at PSES are the same as those controlled at BAT.

We are proposing PSES to prevent pass-through of arsenic, lead, zinc fluoride and germanium. These pollutants are removed by a welloperated POTW achieving secondary treatment at an average of 33 percent while BAT Level A technology removes approximately 87 percent and Level B technology over approximately 93 percent.

Implementation of the proposed Level A PSES limitations would remove annually an estimated 20 kg of to:nc metals, 818 kg of germanium and 376 kg of fluoride.

There are no existing Level B plants in the subcategory which are indirect dischargers. It is estimated that if Level A became Level B plants, an additional 32 kg of toxic metals would be removed annually by the proposed Level B PSES.

The costs and specific removal data for this subcategory are not presented here because the data on which they are. based has been claimed to be confidential. The proposed PSES will not result in adverse economic impacts.

#### Secondary Indium

We are proposing PSES limitations for this subcategory based on lime precipitation and sedimentation technology. The pollutants sepcifically regulated under PSES are cadmium. lead, zinc, and indium. The toxic pollutants chromum, nickel, selenium, silver and thallium were also corridered for regulation because they are present at treatable concentrations in the raw wastewaters from this subcategory. These pollutants were not selected for specific regulation because they will be effectively controlled when the regulated toxic metals are treated to the levels achievable by the model technology. It is necessary to propose PSES to prevent pass-through of cadmum, lead, and zinc. These toxic pollutants are removed by a welloperated POTW achieving secondary treatment at an average of 38 percent while this BAT level technology removes approximately \$9 percent.

Implementation of the proposed FSES limitations would remove annually an estimated 558 kg of toxic metals and 288 kg of indium.

## Secondary Mercury

We are not proposing pretreatment standards for existing sources for the secondary mercury subcategory since there are no existing indirect dischargers.

#### Primary Molybdenum and Rhenium

We are not proposing pretreatment standards for existing sources for the primary molybdenum and rhenium subcategory since there are no existing indirect dischargers.

#### Secondary Molybdenum and Vanadium

We are not proposing pretreatment standards for existing sources for the secondary molybdenum and vanadium subcategory since there are no existing indirect dischargers.

## Primary Nickel and Cobalt

We are not proposing pretreatment standards for existing sources for the primary nickel and cobalt subcategory since there are no existing indirect dischargers.

## Secondary Nickel

We are proposing PSES for this subcategory based on chemical precipitation, sedimentation, and filtration (filtration is proposed for acid reclaim leaching filtrate and acid reclaim leaching filter backwash, but not for slag reclaim tailings). The pollutants specifically regulated under PSES are chromium, copper and nickel. The toxic pollutants arsenic and zinc were also considered for regulation because they are present at treatable concentrations in the raw wastewaters from this subcategory. These pollutants were not selected for specific regulations because they will be effectively controlled when the regulated toxic metals are treated to the levels achievable by the model technololgy. We are proposing PSES to prevent pass-through of chromium copper, and nickel. These toxic pollutants are removed by a welloperated POTW at an average of 32 percent while PSES technology removes approximately 84 percent.

Implementation of the proposed PSES limitations would remove annually an estimated 1,113 kg of toxic metals. We estimate a capital cost of \$287,000 and an annualized cost of \$120,000 to achieve the proposed PSES. The proposed PSES will not result in adverse economic impacts.

#### Primary Precious Metals and Mercury

We are not proposing pretreatment standards for existing sources for the primary precious metals and mercury subcategory because there are no existing indirect dischargers.

#### Secondary Precious Metals

We are proposing PSES equal to BAT for this subcategory. It is necessary to propose this PSES to prevent passthrough of copper, cyanide, zinc, and ammonia. These toxic pollutants are removed by a well-operated POTW achieving secondary treatment at an average of 32 percent while BAT level technology removes approximately 99 percent.

The technology basis for PSES thus is hydroxide precipitation and sedimentation, ammonia steam stripping, cyanide precipitation, wastewater flow reduction, and filtration. The achievable concentration for ammonia steam stripping is based on iron and steel manufacturing category data, as explained in the discussion of BPT and BAT for this subcategory. Flow reduction is based on the same recycle of scrubber effluent that is the flow basis of BAT. Recycle is practiced by 21 of the 29 existing plants in the subcategory.

Implementation of the proposed PSES limitations would remove annually an estimated 98,550 kg of toxic pollutants including 840 kg of cyanide, and an estimated 9,240 kg of ammonia. Capital cost for achieving proposed PSES is \$1,419,000 and annualized cost of \$984,000. The proposed PSES will not result in adverse economic impacts.

An intermediate option considered for PSES is BAT equivalent technology without filters. This option removes an estimated 65,319 kg of toxic pollutants and 9,240 kg of ammonia. We estimate the capital cost of this technololgy is \$1,325,000, and annual cost \$928,000.

## Primary Rare Earth Metals

We are proposing PSES equal to BAT for this subcategory. It is necessary to propose PSES to prevent pass-through of hexachlorobenzene, chromium, lead, and nickel. These toxic pollutants are removed by a well-operated POTW achieving secondary treatment at an average of 28 percent while BAT technology removes approximately 74 percent.

The technology basis for PSES is lime precipitation and sedimentation, wastewater flow reduction, filtration, and activated carbon. Flow reduction is based on 90 percent recycle of scrubber effluent that is the flow basis of BAT. Filtration is an effluent polishing step that removes additional pollutants.

Implementation of the proposed PSES limitations would remove annually an estimated 10.9 kg of toxic pollutants.

The costs and specific removal data for this subcategory are not presented here because the data on which they are based has been claimed to be confidential. The proposed PSES will not result in adverse economic impacts.

An intermediate option considered for PSES is BAT equivalent technology without activated carbon adsorption. This option removes an estimated 1.9 kg of toxic pollutants.

## Secondary Tantalum

We are not proposing pretreatment standards for existing sources for the \* secondary tantalum subcategory since there are no existing indirect dischargers.

## Primary and Secondary Tin

We are proposing PSES equal to BAT for this subcategory. It is necessary to propose PSES to prevent pass-through of antimony, cyanide, lead, nickel, tin, ammonia, and fluoride. The four toxic pollutants and fluoride are removed by a well-operated POTW achieving secondary treatment at an average of 17 percent while BAT technology removes approximately 97 percent.

The technology basis for PSES thus is chemical precipitation and sedimentation, with preliminary treatment consisting of cyanide precipitation and ammonia steam stripping and filtration.

Implementation of the Proposed PSES ·limitations would remove annually an estimated 152 kg of toxic metals, 6,282 kg of tin, 32 kg of cyanide and 25,105 kg fluoride over estimated current discharge. Removals over estimated raw discharge are the same as removals over current discharge because neither of the indirect dischargers in this subcategory has any treatment in place. Capital cost for achieving proposed PSES is \$341,700, and annual cost of \$119,900. The proposed PSES will not result in adverse economic impacts.

## Primary and Secondary Titanium

We are proposing PSES equal to BAT for this subcategory. It is necessary to propose PSES to avoid pass-through of chromium, lead, nickel, thallium, titanium and fluoride. The four toxic pollutants are removed by a welloperated POTW achieving secondary treatment at an average of 14 percent while BAT Level A technology removes approximately 53 percent and Level B technology removes approximately 76 percent.

Implementation of the proposed PSES limitations would remove annually an estimated 1.7 kg of toxic pollutants and 147 kg of titanium.

The costs and specific removal data for this subcategory are not presented here because the data on which they are based has been claimed to be confidential. The proposed PSES will not result in adverse economic impacts.

## Secondary Tungsten and Cobalt

We are not proposing pretreatment standards for existing sources for the secondary tungsten and cobalt subcategory since there are no existing indirect dischargers.

## Secondary Uranium

We are not proposing pretreatment standards for existing sources for the secondary uranium subcategory since there are no existing indirect dischargers.

#### Primary Zirconium and Hafnium

We are proposing PSES for Levels A and B equal to BAT for this subcategory. It is necessary to propose PSES to prevent pass-through of chromium, cyanide, lead, nickel, ammonia and radium (226). These toxic pollutants are removed by a well-operated POTW at an average of 30 percent, while BAT Level A technology removes approximately 40 percent and Level B technology removes approximately 80 percent.

Level A PSES is for plants which only reduce zirconium or zirconium/nickel alloys from  $ZrO_2$  with magnesium or hydrogen. The technology basis for Level A PSES is preliminary treatment consisting of ammonia steam stripping and cyanide precipitation where necessary, lime precipitation, sedimentation, and flow reduction. Level B PSES is for all other plants in the subcategory. Level B PSES is based on preliminary treatment consisting of

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ammonia steam stripping and cyanide precipitation where necessary, lime precipitation, sedimentation, wastewater flow reduction, and filtration. Flow reduction is based on 90 percent recycle of scrubber effluent.

Implementation of the proposed PSES Level A limitations would remove annually an estimated 0.5 kg of toxic pollutants. There is no capital cost for achieving the proposed Level A PSES.

There are currently no Level B plants in this subcategory which are indirect dischargers. If nondischarging plants in this subcategory were to become Level B indirect dischargers, compliance with the proposed Level B PSES would remove 10.6 kg of toxic metals, 7.3 kg of cyanide, and 15 kg of ammonia annually.

The costs and specific removal data for this subcategory are not presented here because the data on which they are based has been claimed to be confidential. The proposed PSES will not result in adverse economic impacts.

# XIV. Pretreatment Standards for New Sources (PSNS)

Section 307(c) of the Act requires EPA to promulgate pretreatment standards for new sources (PSNS) at the same time that it promulgates NSPS. New indirect dischargers will produce wastes having the same pass-through problems as described for existing dischargers. In selecting the technology basis for PSNS, the Agency compares the toxic pollutant removal achieved by a well-operated POTW to that achieved by a direct discharger meeting NSPS. New indirect dischargers, like new direct dischargers, have the opportunity to incorporate the best available demonstrated technologies including process changes, in-plant controls, and end-of-pipe treatment technologies, and to use plant site selection to ensure adequate treatment system installation.

We are proposing only mass-based PSNS for all discharging subcategories to assure that the identified flow reduction technologies are considered in new plant designs.

## Primary Antimony

We are proposing PSNS equivalent to NSPS and BAT. The technology basis for proposed PSNS is identical to NSPS and BAT. It is necessary to propose PSNS to prevent pass-through of toxic metals. These metals are removed by a well operated POTW achieving secondary treatment at an average of 61 percent. PSNS technology removes these pollutants at an average of 98 percent. We know of no economically feasible, demonstrated technology that is better than BAT level technology. No additional flow reduction for new sources is feasible beyond the allowances proposed for BAT. We believe that the proposed PSNS are achievable, and that they are not a barrier to entry of new plants into this subcategory.

## Bauxite Refining

We are not proposing any modifications to PSNS since it is unlikely that any new bauxite sources will be constructed as indirect dischargers.

#### Primary Beryllium

The technology basis for proposed PSNS is identical to NSPS and BAT. It is necessary to propose PSNS to prevent pass-through of beryllium, chromium, copper and fluoride. These toxic pollutants are removed by a welloperated POTW achieving secondary treatment at an average of 41 percent while BAT technology removes approximately 93 percent. We know of no economically feasible, demonstrated technololgy that is better than BAT technology. The PSNS flow allowances are based on minimization of process wastewater wherever possible through the use of holding tanks for wet scrubbing wastewater. The discharges are based on 90 percent recycle of this waste stream (see section IX-Recycle of Wet Scrubber and Contact Cooling Water). No additional flow reduction for new sources is feasible. Because PSNS does not include any additional costs compared to NSPS and BAT, we do not believe it will prevent entry of new plants.

#### Primary Boron

We are proposing PSNS equivalent to NSPS (lime precipitation and sedimentation technololgy) for this subcategory. It is necessary to propose PSNS to prevent pass-through of boron, lead and nickel, which are the regulated pollutants in this subcategory. These toxic pollutants are removed by a welloperated POTW achieving secondary treatment at an average of 34 percent while NSPS level technology removes approximately 85 percent.

We believe that the proposed PSNS are achievable, and that they are not a barrier to entry of new plants into this subcategory.

#### Primary Cesium and Rubidium

We are proposing PSNS equivalent to NSPS. The technology basis for proposed PSNS is identical to NSPS. It is necessary to propose this PSNS to prevent pass-through of toxic metals. These metals are removed by a welloperated POTW achieving secondary treatment at an average of 38 percent. PSNS technology removes these pollutants at an average of 95 percent. We know of no economically feasible, demonstrated technology that is better than NSPS technology.

The costs and specific removal data for this subcategory are not presented here because the data on which they are based and has been claimed to be confidential. We believe that the proposed PSNS are achievable, and that they are not a barrier to entry of new plants into this subcategory.

# Primary and Secondary Germanium and Gallium

We are proposing PSNS equivalent to PSES, NSPS and BAT. The technology basis for proposed PSNS is identical to NSPS, PSES and BAT. The same pollutants pass-through as at PSES, for the same reasons.

We believe that the proposed PSNS are achievable, and that they are not a barrier to entry of new plants into this subcategory.

## Secondary Indium

We are proposing PSNS equal to NSPS. The technology basis for proposed PSNS is identical to NSPS. The same pollutants pass through as at PSES, for the same reasons.

We believe that the proposed PSNS are achievable, and that they are not a barrier to entry of new plants into this subcategory.

## Secondary Mercury

We are proposing PSNS equivalent to NSPS for this subcategory. It is necessary to propose PSNS to prevent pass-through of lead and mercury. These toxic pollutants are removed by a welloperated POTW achieving secondary treatment at an average of 59 percent, while PSNS level technology removes approximately 99 percent.

We believe that the proposed PSNS are achievable, and that they are not a barrier to entry of new plants into this subcategory.

#### Primary Molybdenum and Rhenium

We are proposing PSNS equal to NSPS and BAT for this subcategory. It is necessary to propose PSNS to prevent pass-through of arsenic, lead, nickel, selenium, molybdenum and ammonia. These toxic pollutants are removed by a well-operated POTW achieving secondary treatment at an average of 13 percent, while the NSPS and BAT level technology removes approximately 79 percent.

We believe that the proposed PSNS are achievable, and that they are not a

barrier to entry of new plants into this subcategory.

We are proposing to expand the applicability of the existing PSNS for metallurgical acid plants to include metallurgical acid plants associated with primary molybdenum roasters. It is necessary to propose PSNS to prevent pass-through of arsenic, cadmium, copper, lead, and zinc. These toxic pollutants are removed by a welloperated POTW achieving secondary treatment at an average of 42 percent, while BAT level technology removes approximately 83 percent.

We believe that the proposed PSNS are achievable, and that they are not a barrier to entry of new plants into this subcategory.

## Secondary Molybdemum and Vanadium

We are proposing PSNS equal to NSPS and BAT for this subcategory. It is necessary to propose PSNS to prevent pass-through of antimony, lead, nickel, molybdenum and ammonia. These toxic pollutants are removed by a welloperated POTW achieving secondary treatment at an average of 23 percent, while the NSPS and BAT level technology removes approximately 98 percent.

The technology basis for PSNS thus is hydroxide precipitation and sedimentation, ammonia steam stripping, and filtration. The achievable concentration for ammonia steam stripping is based on iron and steel manufacturing category data, as explained in the discussion of BPT and BAT for this subcategory. Filters are demonstrated at 25 facilities in the nonferrous metals manufacturing category.

We believe that the proposed PSNS are achievable, and that they are not a barrier to entry of new plants into this subcategory.

## Primary Nickel and Cobalt

We are proposing PSNS equal to BAT and NSPS for this subcategory. It is necessary to propose PSNS to prevent pass-through of copper, nickel, cobalt, and ammonia. These toxic pollutants are removed by a well operated POTW at an average of 26 percent, while BAT technology removes approximately 58 percent.

The technology basis for PSNS thus is lime precipitation and sedimentation, ammonia steam stripping, and filtration. The achievable concentration for ammonia steam stripping is based on iron and steel manufacturing category data, as explained in the discussion of BPT and BAT for this subcategory.

We believe that the proposed PSNS are achievable, and that they are not a barrier to entry of new plants into this subcategory.

#### Secondary Nickel

We are proposing PSNS equivalent NSPS and PSES. The same pollutants pass through at PSNS as at PSES, for the same reasons. We know of no economically feasible, demonstrated technology that is better than PSES technology. The PSES flow allowances are based on minimization of process wastewater wherever possible.

We believe that the proposed PSNS are achievable, and that they are not a barrier to entry of new plants into this subcategory.

## Primary Precious Metals and Mercury

We are proposing PSNS equal to NSPS and BAT for this subcategory. It is necessary to propose PSNS to prevent pass-through of arsenic, lead, mercury, silver, and zinc. These toxic pollutants are removed by a well-operated POTW at an average of 62 percent, while the NSPS and BAT technology removes approximately 93 percent.

The technology basis for PSNS thus is lime precipitation and sedimentation, oil skimming, wastewater flow reduction and filtration. Flow reduction is based on 90 percent recycle of scrubber effluent that is the flow basis of BAT.

We believe that the proposed PSNS are achievable, and that they are not a barrier to entry of new plants into this subcategory.

## Secondary Precious Metals

We are proposing PSNS equivalent to NSPS. The technology basis for proposed PSNS 15 identical to NSPS. This is equivalent to PSES and BAT. with additional flow reduction based on dry air pollution control on furnace emissions. The same pollutants pass through at PSNS as at PSES, for the same reasons. We know of no economically feasible, demonstrated technology that is better than NSPS technology. The NSPS flow allowances are based on minimization of process wastewater wherever possible through the use of holding tanks to recycle wet scrubbing wastewater and the use of dry scrubbing to control furnace emissions. The discharges are based on recycle of these waste streams (see section IX-**Recycle of Wet Scrubber and Contact** Cooling Water).

There are no additional costs associated with the installation of dry scrubbers instead of wet scrubbers which were used for estimating cost of BAT. We believe that the proposed PSNS are achievable, and that they are not a barrier to entry of new plants into this subcategory.

#### Primary Rare Earth Metals

We are proposing PSNS equivalent to PSES, NSPS and BAT. The technology basis for proposed PSNS is identical to NSPS, PSES, and BAT. The same pollutants pass through at PSNS as at PSES, for the same reasons. We know of no economically feasible, demonstrated technology that is better than PSES technology. The PSNS flow allowances are equal to the BAT, NSPS and PSES flow allowances.

We believe that the proposed PSNS are achievable, and that they are not a barrier to entry of new plants into this subcategory.

## Secondary Tantalum

We are proposing PSNS equal to NSPS and BAT. It is necessary to propose PSNS to prevent pass-through of copper, lead, nickel, and zinc. These toxic pollutants are removed by a welloperated POTW achieving secondary treatment at an average of 48 percent while BAT level technology removes approximately 99 percent.

We believe that the proposed PSNS are achievable, and that they are not a barrier to entry of new plants into this subcategory.

### Primary and Secondary Tin

We are proposing PSNS equivalent to PSES, NSPS and BAT. The technology basis for proposed PSNS is identical to NSPS, PSES, and BAT. The same pollutants pass through at PSNS as at PSES, for the same reasons. We know of no economically feasible, demonstrated technology that is better than PSES technology. The PSNS flow allowances are identical to the flow allowances for BAT, NSPS, and PSES.

There would be no additional cost for PSNS above the costs estimated for BAT. We believe that the proposed PSNS are achievable, and that they are not a barrier to entry of new plants into this subcategory.

## Primary and Secondary Titanium

We are proposing Level A and Level B PSNS equivalent to NSPS. The technology basis for proposed PSNS is identical to NSPS. The same pollutants are regulated at PSNS as at PSES and they pass through at PSNS as at PSES, for the same reasons. The PSNS and NSPS flow allowances are based on minimization of process wastewater wherever possible through the use of cooling towers to recycle contact cooling water and holding tanks for wet scrubbing wastewater. The discharge allowance for pollutants is the same at PSNS and NSPS. The discharges are based on 90 percent recycle of these

waste-streams (see section IX—Recycle of Wet Scrubber and Contact Cooling Water). As in NSPS, flow reduction beyond BAT is proposed for chip crushing, sponge crushing and screening and scrap milling wet air pollution control based on dry scrubbing. Also zero discharge is proposed for chlorine liquefaction wet air pollution control based on byproduct recovery.

We believe that the proposed PSNS are achievable, and that they are not a barrier to entry of new plants into this subcatetory.

## Secondary Tungsten and Cobalt

We are proposing PSNS equal to NSPS and BAT for this subcategory. It is necessary to propose PSNS to prevent pass-through of copper, nickel, cobalt, and ammonia. These toxic pollutants are removed by a well-operated POTW achieving secondary treatment at an average of 26 percent, while the NSPS and BAT<sup>level</sup> technology removes approximately 97 percent.

The technology basis for PSNS thus is lime precipitation and sedimentation, oil skimming, ammonia steam stripping, wastewater flow reduction and filtration. The achievable concentration for ammonia steam stripping is based on iron and steel manufacturing category data, as explained in the discussion of BPT and BAT for this subcategory. Flow reduction is based on 90 percent recycle of scrubber effluent that is the flow basis of BAT.

We believe that the proposed PSNS are achievable, and that they are not a barrier to entry of new plants into this subcategory.

## Secondary Uranium

We are proposing PSNS equal to NSPS and BAT for this subcategory. It is necessary to propose PSNS to prevent pass-through of chromium, copper, nickel, ammonia, uranium and fluoride. These toxic pollutants are removed by a well-operated POTW achieving secondary treatment at an average of 40 percent, while the NSPS and BAT level technology removes approximately 88 percent.

The technology basis for PSNS is lime precipitation, sedimentation, and ammonia steam stripping, followed by filtration.

We believe that the proposed PSNS are achievable, and that they are not a barrier to entry of new plants into this subcategory.

#### Primary Zirconium and Hafnium

We are proposing PSNS equivalent to PSES, NSPS and BAT. The technology basis for proposed PSNS is identical to NSPS: The same pollutants pass through as at PSES, for the same reasons. We know of no economically feasible, demonstrated technology that is better than PSES technology.

We believe that the proposed PSNS are achievable, and that they are not a barrier to entry of new plants into this subcategory.

#### **XV** Regulated Pollutants

The basis upon which the controlled pollutants were selected, as well as the general nature and environmental effects of these pollutants, is set out in sections V, VI, IX, and X of the General Development Document and each of the subcategory supplements. Some of these pollutants are designated as toxic under section 307(a) of the Act. Three pollutants have been deleted from the list of 129. These are dichlorodifluoromethane, and trichlorofluoromethane (46 FR 2226 (January 8, 1981)), and bis(chloromethyl ether (46 FR 10723 (February 4, 1981)).

The pollutants selected for regulation are listed by subcategory in Appendix B.

XVI. Pollutants and Subcategories Not Regulated

The Settlement Agreement contains provisions authorizing the exclusion from regulation, in certain instances, of toxic pollutants and industry subcategories.

#### A. Exclusion of Pollutants

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-theart methods. The toxic pollutants not detected and, therefore, excluded from regulation are listed in Appendix C of this notice by subcategory. Also included in Appendix C are toxic pollutants not analyzed for in each subcategory.

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. Appendix E to this notice lists the toxic pollutants in each subcategory present in amounts which are too small to be effectively reduced by technologies considered applicable to the category 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 the are uniquely related to those sources. Appendix F to this notice lists for each subcategory the toxic pollutants which were detected in the effluents of only one plant, are uniquely related to the plant, and are not related to the manufacturing processes under study.

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 or pretreatment standards. Appendix G lists those toxic pollutants which will be effectively controlled by the BAT limitations, NSPS, and pretreatment standards, even though they are not specifically regulated.

#### **B. Exclusion of Subcategories**

EPA executed an affidavit on May 10, 1979 excluding six primary and five secondary metal subcategories from regulation under Paragraph 8(a)(iv) of the Settlement Agreement. The subcategories were:

Primary Arsenic Primary Antimony Primary Barium Primary Bismuth Primary Calcium Primary Tin Secondary Beryllium Secondary Cadmium Secondary Molybdenum Secondary Tantalum Secondary Babbitt

Four of these excluded subcategories—primary antimony, primary tin, secondary molybdenum, and secondary tantalum, have been reconsidered for regulation in nonferrous phase II. This is due to data received by EPA since May 10, 1979, showing a need for effluent guidelines to be established for these four subcategories. Today's notice proposes effluent limitations and guidelines which include these four subcategories.

In addition to the subcategories already excluded under Paragraph 8(a)(iv) of the Settlement Agreement, EPA proposed to exclude two additional primary and one additional secondary metal subcategory from regulation. EPA proposes these exclusions because no existing primary lithium or secondary zinc plants discharge wastewater and because there are no pollutants at treatable concentrations in primary magnesium discharges. The subcategories are:

Primary Lithium Primary Magnesium Secondary Zinc The Agency is excluding the following subcategories from BAT effluent guidelines and pretreatment standards for existing sources under provisions of Paragraph 8(a)(iv) because there are no facilities discharging wastewater to surface waters or POTW They are:

#### Primary Boron Primary Cesium and Rubidium Secondary Mercury

The Agency is excluding the following subcategories from BAT effluent guidelines under provisions of Paragraph 8(a)(iv) because there are no facilities discharging wastewater to surface waters. They are:

#### Secondary Indium Secondary Nickel

In today's notice, EPA proposes to exclude 10 subcategories from pretreatment standards for existing sources because there are no facilities discharging wastewater to POTW. They are:

Primary Antimony Bauxite Refining Primary Beryllium Primary Molybdenum and Rhenium Secondary Molybdenum and Vanadium Primary Nickel and Cobalt Primary Precious Metals and Mercury Secondary Tantalum Secondary Tungsten and Cobalt Secondary Uranium

## XVII. Cost and Economic Impacts

The economic assessment of the proposed regulation is presented in the 'Economic Impact Analysis of Proposed Effluent Standards and Limitations for the Nonferrous Smelting and Refining Industry, Phase II," EPA 440/2-84-009. This report details the investment and annual costs for the industry and for each metal subcategory covered by the proposed regulation. Compliance costs are based on engineering estimates of incremental capital requirements above the water pollution control equipment already in-place. The report assesses the impact of effluent control costs associated with each regulatory option in terms of price changes, cost of production changes, plant closures and associated loss of employment, financial impacts and balances of trade effects.

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. For some pollutants howeyer, toxicity data with respect to human health or chronic, aquatic freshwater criteria are unavailable. Alternative data sources were therefore employed to determine weighting factors for these pollutants based on criteria similar, but not identical, to those used for other pollutants.

The use of "pound equivalent" gives relatively more weight to removal of pollutants that are more toxic. 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, which includes detailed descriptions of how all weighting factors were determined, is entitled "Cost Effectiveness Analysis of Proposed Effluent Standards and Limitations for the Nonferrous Metals Manufacturing Industry (Phase II)" and is included in the record for this rulemaking.

The Agency projects there will be 72 "wet-process" manufacturing facilities covered by this regulation. Thirty-four of these plants will discharge their wastewater directly into navigable waters, and 38 will discharge into publicly owned treatment works (POTW). In addition, there will be 83 other facilities which will not produce any wastewater, and therefore not incur costs as a result of the regulation.

Total capital costs for the discharging plants as a result of this regulation are estimated to be \$7 million, while total annual costs, including depreciation and interest, are estimated to be \$4.4 million. These costs are expressed in 1982 dollars. The major projected economic impacts associated with these costs are 3 plant closures and 2 production line closures at the BPT level of control with an accompanying employment loss of 47 people. The 3 plant closures and one line closure are in the primary and secondary tin subcategory, while the remaining line closure is in the secondary precious metals subcategory. The tin closures imply a potential loss of 12 percent of production capacity for that subcategory, while the production loss for secondary precious is insignificant. While the impacts of the regulation on tin manufacturers are projected to be significant, in that four of the five discharging plants or lines in the tin subcategory would discontinue production as a result of this regulation, we suspect the assumptions employed in our baseline scenario may be pessimistic. Hence, the Agency solicits comment and plans to obtain further market and plant-specific information to improve the accuracy of our analysis. We intend to request additional financial data under the authority of

section 308 of the CWA. Information obtained from these plants will be combined with other public data sources to reassess projected baseline conditions for the tin market. If, at promulgation, after reassessing and updating the financial information, EPA determines that there would be a disproportionate impact on any specific segment of this subcategory, the Agency may establish standards based on less stringent technologies. We will solicit data and information specifically relevant to alternative technologies and the appropriateness of a size cut-off with respect to production levels, especially in light of the additional pollutants that would be discharged to the waters.

No further significant impacts are projected as a result of the regulation. Price increases are not expected to exceed 2.5 percent for any subcategory, and balance of trade effects are minimal. No further production loss beyond that described above is expected to occur.

The Economic Impact Analysis assumed a reasonable rate of monitoring (between one and 30 times per month), 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 the increased monitoring activity. The analysis showed three additional plant closures occurring as a result of the higher monitoring costs.

For purposes of this regulation, the Agency created 24 separate subcategories based on metal products produced. The economic analysis focuses on 21 of these subcategories, since the remaining three were exempt from regulation under Paragraph 8 of the Clean Water Act. The 21 subcategories are discussed in detail in the economic impact analysis document. Plant descriptions are provided along with market analyses of the metals products produced in each subcategory.

The methodology employed to determine economic impacts is very similar to that used for the Phase I portion of the Nonferrous Metals Manufacturing category (EPA 440/2-04-004). The approach begins with a screening analysis to identify plants that will be significantly affected by the regulation. This consists of a comparison of a plant's estimated annual compliance costs to its projected revenues. If this ratio is found to exceed 1 percent, the plant is then subjected to a 2-step closure analysis: a net present value test and a liquidity test.

The net present value test is designed to assess the firm's long-term profitability. The viability of the plant is judged by a comparison of its cash flows over the entire compliance period to its current liquidation value. The liquidity test, on the other hand, assesses the firm's short-term solvency during the first five years of compliance. If estimated cash-flows over the five years are negative, the plant is cited as potentially insolvent and in danger of closure. Both tests require the estimation of plant revenues in future years in order to determine income and cash flows for those years. This income is taken to be the average of income between 1978-82, a period which spanned a complete business cycle. Average product price over the period was used in conjunction with the average capacity utilization rate over the period to arrive at an estimate of total sales for each plant in a "normal" year. This figure was then used as the basis for the determination of average income which, minus compliance costs, served as the estimate of cash flow for the specific plant.

Structurally, the approach is identical to that used in the Nonferrous Metals Phase I analysis. The only substantive difference involves the estimation of plant specific compliance costs. The Agency's estimation of costs for plants in the Phase II study was based on effluent data gathered in 1982, when production and wastewater flows were abnormally low as a result of the recession. Since compliance costs are related to production and flow, and 1982 production was severely depressed, it was felt that costs based on 1982 production would not be an accurate estimate of costs that would be actually incurred at the time of compliance. The Agency assumes the industry will recover to "normal" production levels as implied by the average capacity utilization rate from 1978-82. Most plants operated well below this average in 1982; hence we project their output at the time of compliance will be substantially higher. Consequently, compliance costs which reflect 1982 production levels are understated. For purposes of the economic impact analysis, the Agency's initial compliance cost estimates were adjusted upwards for most plants. The adjustment factors reflect the expanded production expected for the compliance period (as implied by the average capacity usage rate from 1978-82), yet also account for economies of scale in the output/ compliance cost relationship.

Details concerning specific plants are available in the record of this proposed rulemaking. See also the Economic Impact Analysis document (EPA 440/2– 84–009) for subcategory discussions.

**BPT: New BPT limitations are** proposed for 14 subcategories, with 27 plants incurring compliance costs. Investment costs are estimated to be \$3.7 million and total annualized costs are \$3.0 million. Significant economic impacts are projected only for the tin subcategory, with 1 plant and 1 production line projected to close as a result of this regulation. The impacts on the other subcategories are small, with price changes ranging from less than one-tenth to two percent. No balance of trade effects are expected. Potential production losses are expected only for tin (less than 10 percent of 1982 industry capacity) and secondary precious metals (less than 1 percent).

**BAT: New BAT limitations are** proposed for 14 subcategories. Total investment costs for these regulations are estimated to be \$4.2 million and total annualized costs are \$3.2 million. The incremental costs over BPT are estimated to be \$0.5 million in investment costs and S0.2 million in annual costs. No additional closures or production loss beyond those expected at BPT are expected to result from these limitations. The price increases associated with these costs are small, ranging from less than one-tenth to 2.4 percent and the limitations are economically achievable.

PSES: PSES is proposed for 8 subcategories. The costs for this regulation are expected to be \$2.8 million investment and \$1.2 million total annualized costs. Closures projected to result from these costs include a secondary gold production process line in a secondary precious metals plant and two tin plants. The precious metals plant also produces secondary silver and therefore is integrated with the secondary silver subcategory in the Nonferrous Metals Phase I regulation. It was projected that compliance costs associated with the Phase I regulation will result in the closure of the secondary silver process line as well. The combined effects of the two regulations therefore is the closure of the entire facility and the associated loss of approximately 19 jobs. However, the loss of secondary gold/silver production capacity is minimal. The plant represents less than one-half of one percent of industry capacity for both metals. The effect on tin production is discussed in previous sections of this preamble. Impacts of PSES on the entire secondary precious metals subcategory and all other subcategories are small overall. The range of expected price

increases is less than one-tenth to 2.5 percent and no further production loss is expected to occur. These standards are economically achievable for the subcategories as a whole.

NSPS/PSNS: New source standards are being proposed for 20 of the 24 subcategories. The technology basis for NSPS and PSNS is the same as for BAT for all subcategories where BAT and PSES are proposed except one, Secondary Indium. Three of the 21 subcategories are subject only to new source limitations because they contain no existing discharging plants. These subcategories are Primary Boron, Primary Cesium and Rubidium and Secondary Mercury. New plants in these subcategories, as well as those in Secondary Indium, will not be at a serious cost disadvantage as a result of these limitations. Total incremental investment costs are estimated to be \$31. thousand, with annual costs of \$11 thousand. Hence this regulation is not expected to discourage entry into the industry.

The Agency believes this regulation is economically achievable and imposes no significant impacts on any subcategory within the industry. The only possible exception is tin, where projected closures at this point threaten 12 percent of existing industry production capacity. As explained earlier, however, the Agency plans to reassess the tin industry through comment solicitation and direct contact with tin manufacturers between proposal and promulgation of this regulation.

## Executive Order 12291

Executive Order 12291 requires EPA and other agencies to perform regulatory impact analysis of major regulations. Major rules impose an annual cost to the economy of \$100 million or more or meet other economic impact criteria. The proposed regulation for monferrous metals manufacturing, Phase II, is not a major rule. The costs expected to be incurred by this industry will be significantly less than \$100 million. Therefore a formal Regulatory Impact Analysis is not required. This rulemaking satisfies the requirements of the Executive Order for a nonmajor rule. The Agency's regulatory strategy considered both the cost and economic impacts of the regulation.

## **Regulatory Flexibility Analysis**

Pub. L. 96–354 requires that EPA prepare a Regulatory Flexibility Analysis for regulations that have a significant impact on a substantial number of small entities. This analysis may be conducted in conjunction with or as part of other Agency analyses. A small business analysis is included in the economic impact analysis for this regulation.

For each metal subcategory, small entities were defined on the plant level, using annual plant capacity as an indicator of size. A total of 14 plants were identified in 5 subcategories as small, representing 19 percent of all discharging plants. For these 5 subcategories, the Agency evaluated (1) annual compliance costs as a percentage of revenues for small facilities and (2) annual compliance costs as a percent of the cost of production for small entities. Based on this analysis, EPA has determined that there will not be a significant impact on small entities within this category. Therefore the Agency is not required to perform a formal Regulatory Flexibility Analysis. I hereby certify pursuant to 50 U.S.C. 605(b) that this regulation will not have a significant impact on a substantial number of small entities.

#### 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 1500 employees (dependent upon industry), and annual sales revenues ranges from \$275,000 to \$22 million (varies by industry).

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-backed 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 SBA. This program has interest rates equivalent to market rates.

For additional information on the **Regular Business Loan and Section 503** Programs, contact your district or local

SBA office. The coordinator at EPA headquarters is Ms. Frances Dessell, who may be reached at (200) 382-5373.

# XVIII. Nonwater Quality Aspects of Pollution Control

The elimination or reduction of one form of pollution may aggravate other environmental problems. Therefore, sections 304(b) and 306 of the Act require EPA to consider the nonwater quality environmental impacts (including energy requirements) of certain regulations. In compliance with these provisions, EPA has considered the effect of this regulation on air pollution, solid waste generation, water scarcity, and energy consumption. While it is difficult to balance pollution problems against each other and against energy utilization, EPA 1s proposing regulations which it believes best serve often competing national goals. This regulation has been reviewed by other offices within EPA responsible for these programs.

The following are the nonwater quality environmental impacts (including energy requirements) associated with the proposed regulations:

## A. Air Pollution

Imposition of BPT will not create any substantial air pollution problems. BAT, NSPS, PSES, and PSNS will result in a slight increase in air pollution. Water vapor containing some particulate matter will be released in the drift from the cooling tower systems which are used as the technology basis for flow reduction which is a part of BAT, NSPS, PSES, and PSNS in one subcategory, primary and secondary titanium. Plants in this subcategory using lubricants for casting may have organics present in the drift from cooling towers used to cool and recylce casting contact cooling water. The Agency does not consider any of these impacts to be significant.

## B. Solid Waste

EPA estimates that the proposed BPT regulation for nonferrous metals manufacturing phase II facilities will generate 8,500 kkg (9,350 tons) of solid wastes (wet basis-1982 production levels) as a result of wastewater treatment. These wastes will be comprised of treatment system sludges containing cyanide and toxic metals, including arsenic, antimony, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver. thallium, and zinc.

EPA estimates that BAT and PSES will increase wastes by approximately 2100 kkg (2310 tons) per year beyond BPT levels. These sludges will

necessarily contain additional quantities (and concentrations) of toxic pollutants. NSPS and PSNS will increase the amount of solid waste by less than 5 percent of the BAT and PSES quantities.

Wastes generated by primary smolters and refiners are currently exempt from regulation by Act of Congress [Resource **Conservation and Recovery Act** (RCRA), section 3001(b)]. Consequently, sludges generated from treating primary industries' wastewater are not presently subject to regulation as hazardous wastes.

Wastes generated by secondary metal industries can be regulated as hazardous. However, the Agency examined the solid wastes that would be generated at secondary nonferrous metals manufacturing plans by the suggested treatment technologies and believes they are not hazardous wastes under the Agency's regulations implementing section 3001 of the **Resource Conservation and Recovery** Act. None of these wastes are listed specifically as hazardous. Nor are they likely to exhibit a characteristic of hazardous waste. This judgment is made based on the recommended technology of lime precipitation and filtration. 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 Extraction Procedure (EP) toxicity test. See 40 CFR 261.24. Thus, the Agency believes that the wastewater sludges will similarly not be EP toxic if the recommended technology is applied.

Although it is the Agency's view that solid wastes generated as a result of these guidelines are not expected to be hazardous, generators of these wastes must test the waste to determine if the wastes meet any of the characteristics of hazardous waste (see 40 CFR 262.11).

If these wastes identified should be or are listed as hazardous, they will come within the scope of RCRA's "cradle to grave" hazardous waste management program, requiring regulation from the point of generation to point of final disposition. EPA's generator standards would require generators of hazardous nonferrous metals manufacturing wastes to meet containerization, labeling, recordkeeping, and reporting requirements; if plants dispose of hazardous wastes off-site, they would have to prepare a manifest which would track the movement of the wastes from the generator's premises to a permitted off-site treatment, storage, or disposal facility. See 40 CFR 262.20 [45 FR 33142 (May 19, 1980), as amended at 45 FR 86973 (December 31, 1980)]. The

transporter regulations require transporters of hazardous wastes to comply with the manifest system to assure that the wastes are delivered to a permitted facility. See 40 CFR 263.20 [45 FR 33151 [May 19, 1980], as amended at 45 FR 86973 (December 31, 1980)]. Finally, RCRA regulations establish standards for hazardous waste treatment, storage and disposal facilities allowed to receive such wastes. See 40 CFR Part 464 [46 FR 2802 [January 12, 1981], 47 FR 32274 [July 26, 1982]].

Even if these wastes are not identified as hazardous, they still must be disposed of in compliance with the Subtitle D open dumping standards, implementing 4004 of RCRA. See 44 FR 53438 (September 13, 1979). The Agency has calculated as part of the costs for wastewater treatment the cost of hauling and disposing of these wastes. For more details, see Section VIII of the General Development Document.

## C. Energy Requirements

EPA estimates that the achievement of proposed BPT effluent limitations will result in electrical energy consumption of approximately 18.5 million kilowatthours per year. The BAT and PSES technology should not substantially increase the energy requirements of BPT because the additional pumping requirements for filtration should be offset by the reduced pumping requirements, the agitation requirements for mixing wastewater and other volume related energy requirements, as a result of reducing process wastewater discharge to treatment. To achieve the proposed BPT and BAT effluent limitations, a typical direct discharger will increase total energy consumption by less than 1 percent of the energy consumed for production purposes.

The Agency estimates that the NSPS and PSNS technology will, in general, require as much energy as the existing source limitations.

## XIX. Best Management Practices (BMP)

Section 304(e) of the Clean Water Act authorizes the Administrator to prescribe "best management practices" (BMP) described under Legal Authority and Background. EPA is not proposing specific BMP for nonferrous metals manufacturing at this time.

## XX. 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 mevitably occur even in properly operated control comment. 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 proposed NPDES permits that include upset and bypass permit provisions (see 40 CFR 122.41 (m) and (n), 48 FR 14148 (April 1, 1983)). The upset provision establishes an upset as an affirmative defense to prosecution for violation of technologybased effluent limitations. The bypass provision authorizes bypassing to prevent loss of life, personal injury, or severe property damage. Consequently, although permittees in the nonferrous metals manufacturing industry will be entitled to upset and bypass provisions in NPDES permits, this proposed regulation does not address these issues.

#### XXI. Variances and Modifications

Upon promulgation of the final regulation, the appropriate effluent limitations must be applied in all Federal and State NPDES permits therafter issued to direct dischargers in the nonferrous metals manufacturing category. In addition, on promulgation, the pretreatment limitations are directly applicable to any indirect dischargers.

For BPT effluent limitations, the only exception to the binding limitations is EPA's "fundamentally different factors" variance. See E. I. du Pont de Nemours Co. v. Train, 430 U.S. 112 (1977); Weyerhaeuser Co. v. Costle, supra. This variance recognizes factors concerning a particular discharger that are fundamentally different from the factors considered in this rulemaking. 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 nonferrous metals manufacturing category or other category regulations. See the NPDES regulations at 40 CFR Part 125 Subpart D, 45 FR 33290 et seq. [May 19, 1930] 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 individual modifications under sections 301(c) and 301(g) of the Act. According to section 301(j)(1)(B), applications for these modifications under sections 301(c) and 301(g) must be filed within 270 days after promulgation of final effluent limitations guidelines. See 40 CFR 122.21(1)(2), 48 FR 14161 (April 1, 1983).

The economic modification section of the Act (section 301(c)) gives the Administrator authority to modify BAT requirements for nonconventional pollutants 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 carcinogenicity, mutagenicity, or teratogenicity), or synergistic propensities.

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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. du Pont 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 regulated under PSES 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).

In a few cases, information which would affect certain 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 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 the ability to pay that cost).

After this regulation is promulgated 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. Accordingly persons should submit all available information suggesting that alternate limitations should be established for specific facilities during the comment period for this regulation.

XXII. Implementation of Limitations and Standards

## A. Relation to NPDES Permits

The BPT and BAT limitations and NSPS in this regulation will be applied to individual nonferrous metals 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. 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 waste streams; the average 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 data, and a certification that these methods conform to the methods

outlined in the regulations. See 40 CFR 403.12(e).

INDIRECT DISCHARGERS SOMEDULE FOR SUBMITTAL AND COMPLIANCE

1tem	Applicable sources	Date or time period	Measured from	Submitted to
Request for Category Determination	Existing	60 days or 60 days	From effective date of standard From Rederal Register Development Document Avail-	Director (1).
Baseline Monitoring	New	Prior to commencement of discharge to POTAV.		
Report on Compliance	Existing	90 days	From effective date of standard or final decision on category determination. From date for final compliance	Control Authority (2)
Periodic Compliance Reports	New All	90 days Jurre and December	From commencement of discharge to POTW	Control Authority (2).

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

## XXIIL Solicitation of Comments

EPA invites public participation in this rulemaking. We ask that any perceived deficiencies in the record be addressed specifically. We also ask that any suggested revisions or conrections be supported by data.

In addition to issues already addressed in the preamble, EPA is particularly interested in receiving additional comments and information on the following issues:

1. In our discussion of choices for BAT, PSES, NSPS, and PSNS for each subcategory, we described the range of options we considered. We formally solicit comment on whether we should adopt less or more stringent options in each subcategory, and if so, why.

2. The Agency is continuing to seek additional data to support these proposed limitations. In preparing this regulation, the agency collected allowable data on the raw wastewaters and treated wastewaters characteristics of each subcategory and compared it to other available treatment effectiveness data. The treatment effectiveness data for lime and settle and lime, settle and filter technology are based on the results of Agency sampling of the raw wastewaters and treated effluents from a broad range of plants generating similar wastewaters and (for filtration) on long-term self-monitoring, because we believe that these data most appropriately represent the treatment effectiveness of the specific technology. The Agency invites comments on the treatment effectiveness results, and the statistical analysis and underlying assumptions discussed in Section VII of the Development Document as they pertain to the nonferrous metals manufacturing plants. The Agency specifically requests long-term sampling data (especially paired raw wastewater-treated effluent data) from nonferrous metals manufacturing plants having well-operated treatment systems using the treatment technologies relied upon for this regulation, and also other equally effective treatment technologies.

3. The Agency requests long-term sampling data (especially paired raw wastewater-treated effluent data) from any plants treating antimony, arsenic, beryllium, boron, cadmium, chromium, cobalt, copper, cyanide, fluoride, germanium, indium, lead, mercury, molybdenum, nickel, radium 226, selenium, silver, thallium, tin, titanium, uranium and zinc that use chemical precipitation and settling technology (with and without a polishing filter).

4. In its cost estimates the Agency has not considered cost savings associated with water flow reduction, such as reduced charges for water use and sewerage savings. The Agency invites comments and requests that cost data be submitted to the Agency.

5. Nonferrous plants in roughly half the subcategories (primary and secondary germanium and gallium, secondary indium, secondary nickel, secondary precious metals, primary rare earth metals, primary and secondary tin. primary and secondary titanium, and primary zirconium and hafnium) discharge to POTWs. Because their wastewaters contain substantial amounts of toxic metals, the Agency invites comments and any supporting data concerning incompatibility of these wastewaters with the POTW treatment systems or sludge dispostion.

6. We request comment as to whether nonferrous plants could incur disproportionate costs as a result of treating both nonferrous wastewaters and wastewaters from a different point source category.

7. We request that commenters identify any process wastewater streams not identified by EPA which they believe should receive a discharge.

allowance. For any such streams. commenters should identify flow Jin relation to production normalized parameter) and pollutant concentrations.

8. The Agency is proposing BAT, NSPS, PSES, and PSNS based on Options B and C, which include inprocess flow reduction of many wastewater streams. We solicit comments on the ability of nonferrous metals manufacturing plants to achieve 90 percent recycle of wet scrubber liquor, and casting contact cooling water. We also solicit comments on the ability of nonferrous metals manufacturing to achieve 90 percent recycle of wet scrubber liquor, where the scrubber is used to control acid fumes emissions.

9. For several subcategories, the Agency is proposing an ammonia limitation on both direct and indirect dischargers. The Agency requests comments on the appropriateness of limiting ammonia in the effluent from indirect dischargers. Also, we request comments on the proposed treatment performance concentrations for ammonia based on stream stripping.

10. In developing the plant-by-plant economic analysis, the Agency made assumptions concerning the effect on final effluent of a poorly operated waste treatement system. For a poorly operated waste treatment system, we assumed a discharge equal to raw waste influent. The agency requests comment on the appropriateness of this assumption.

11. For the secondary precious metals subcategory, we are proposing NSPS and PSNS based, in part, on dry scrubbing of furnace emissions. We solicit comment on the feasibility of this technology in new plants.

12. For the bauxite refining subcategory, we solicit additional data on red mud lake closure plans for currently operating and shut-down plants. We have discussed the possible limitation of three toxic organic pollutants in rainfall runoff from red mud lakes. We also solicit comments on the regulation of these pollutants.

13. We have proposed that the date for compliance with PSES be three years from the regulation's final promulgation date. We invite comments on the appropriateness of the compliance date.

14. The Agency requests comments on the appropriateness of the cyanide limitations proposed for the secondary precious metals, tin, and zirconium and hafnium subcategories.

15. The Agency is not modifying the promulgated limitations and standards for bauxite refining in this proposed regulation. As a result bauxite plants could continue to discharge equal to the net monthly precipitation falling on the red mud impoundment. EPA has data that indicated these discharges contain phenol, 2-chlorophenol and total phenols (4AAP) in treatable quantities. By using activated carbon adsorption, we project that 4800 lb/yr of phenols would be removed from the discharges of four plants. The investment cost of this removal would be \$8.3 million and the annual cost would be \$2.1 million.

EPA's present data base does not indicate that these phenols are being discharged in quanties that will present any acute risk to human health or aquatic life. However, under certain conditions these discharges may create taste and odor problems with drinking water supplies downstream of these discharges.

As a result, we intend to collect additional data between proposal and promulgation of this regulation. We solicit data on the presence of phenols in discharges from bauxite plants, as well as comments on the relative significance of these discharges to water quality problems in receiving waters. We also solicit comments and data on the presence of other toxic and nonconventional pollutants (such as toxic metals or iron) in these discharges. If we identify risk to human health, risk to aquatic life or aquatic taste and odor problems sufficient to justify the costs of compliance we intend to promulgate BAT and NSPS limits for phenol, 2chlorophenol, and phenols (4AAP) based on an achievable daily maximum concentration of 0.010 mg/l for each pollutant. We also solicit comment on the achievability of this concentration using activated carbon adsorption or chemical oxidation (i.e. ozone, permanganate, or hydrogen peroxide).

16. The methodology used to estimate the economic effects of these regulations is discussed in section XVII of this preamble and in the Economic **Development Document. We solicit** comments on the methodology and criteria used to screen for economic impacts and on the methodology presented for financial analyses of individual plants. In this regard we solicit comment on the Agency's reliance on five year production and sales averages for certain facilities and subcategories in which the Agency believes that the available 1982 data is not representative of their future economic status because of the fact that 1982 was a particularly poor year for certain industries due to the recession and because we anticipate higher levels of production and sales due to the economy's recovery. The Agency plans to reassess a number of its estimates used in its economic analysis based on the economic recession and expected recovery. We solicit information on current production levels for the industry, prices, returns on investment. and changes in industry capacity. We solicit historical information on these same factors so we can evaluate how they change with the general economic conditions. We solicit information on structural changes in the industry that have occurred and changes in the competitive position in the international markets. We specifically solicit comment and additional data and information on the Agency's assumptions and calculations in projecting increased production levels and associated pollution removal costs in moving from 1982 levels to the higher 5 year economic average relied upon. We solicit comment both on the methodology used and its application to particular facilities and subcategories.

17 A number of firms have not responded to the economic survey mailed to them under the authority of section 308 of the Clean Water Act. The Agency asks facilities that have failed to respond to submit their responses. If the questionnaire has been misplaced there is a blank copy of a survey in the Appendix of the Economic Impact Analysis that can be used or a duplicate of the survey will be sent directly upon request to Ms. Ellen Warhit.

18. In may industries, indirect dischargers are located in urban areas, whereas direct dischargers tend to be located in more rural areas. This can sometimes place indirect dischargers at a disadvantage interms of space availability for installing wastewater treatment. However, EPA has concluded that space availability presents no greater problem for existing indirect dischargers than for existing direct dischargers in the nonferrous metals manufacturing category. We request comment on this conclusion.

19. The Agency has discussed the potential economic impacts of this regulation on the secondary tin subcategory. We solicit comment on the issues raised in these discussions.

20. When estimating the cost of meeting discharge limitations based on lime and settle technology in the cosiumrubidium subcategory the Agency used the cost of land disposal of wastewaters when the quantity of such wastewater was so small as to make the cost of land disposal less than lime and settle treatment. Comment on this costing procedure is requested.

21. The Agency is considering the promulgation of fluoride limitations and standards for the primary molybdenum subcategory. These mass limitations and standards would be based on the treatment performance observed on similar untreated fluoride concentrations in the Electrical and Electronic Products Point Source Category (Phase II). Therefore, we are requesting comment on the achievability of mass limitations and standards calculated based on a daily maximum concentration of 35.0 mg/l and a monthly average concentration of 19.9 mg/l. Further information on this subject and the actual mass limitations are available in the supplemental development document for this subcategory.

This regulation was submitted to the Office of Management and Budget for review as required by Executive Order 12291. This proposed 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 421

Nonferrous metals manufacturing, Water pollution control, Waste treatment and disposal.

Dated: May 15, 1984. William Ruckelshaus, *Administrator*.

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

Act—The Clean Water Act. Agency—The U.S. Environmental Protection Agency.

BAT—The best available technology economically achievable under 4(b)(2)(B) of the Act.

BCT-The best conventional pollutant control technology under section 304(b)(4) of the Act.

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

BPT-The best practicable control technology currently available on 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).

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 Permits—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 dischargers under section 307(b) of the Act.

PSNS-Pretreatment standards for new sources of indirect dischargers under sections 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—Pollutants Selected for **Regulation by Subcategory** 

(a) Subpart A-Bauxite Refining

- Subcategory 24. (2-chlorophenol)
- 65. (phenol), (phenols 4AAP), (pH)

(As discussed earlier, the Agency is considering effluent limitations for discharges from bauxite red mud impoundments. To assist the public in providing comment on this issue, we are providing information in this appendix on the bauxite subcategory.)

(b) Subpart N-Primary Antimony

- Subcategory
- 114. antimony
- 115. arsenic 122. lead
- 123. mercury, total suspended solids (TSS), pH
- (c) Subpart O-Primary Beryllium Subcategory
  - 117 bervllium

119. chromium

- 120. copper, fluoride, total suspended solids (TSS), pH
- (d) Subpart P-Primary Boron Subcategory

122. lead

124. nickel, boron, total suspended solids (TSS), pH-

- (e) Subpart O-Primary Cesium and **Rubidium Subcategory** 
  - 122. lead
  - 127 thallium 128. zinc, total suspended solids
  - (TSS), pH
- (f) Subpart R-Primary and Secondary Germanium and Gallium Subcategory
  - 115. arsenic
  - 122. lead
- 128. zinc, fluoride, germanium, total suspended solids (TSS), pH
- (g) Subpart S-Secondary Indium
- Subcategory
- 118. cadmium
- 122. lead
- 128. zinc, indium, total suspended solids (TSS), pH (h) Subpart T—Secondary Mercury
- Subcategory
  - 122. lead
- 123. mercury, total suspended solids (TSS), pH
- (i) Subpart U-Primary Molvbdenum and Rhenium Subcategory 115. arsenic
  - 122. lead
  - 124. nickel
  - 125. selenium, molybdenum, ammonia (as N), total suspended solids (TSS), pH
- (j) Subpart V—Secondary Molybdenum and Vanadium Subcategory. 114. antimonv
  - 122. lead
- 124. nickel, molybdenum, ammonia (as N), total suspended solids (TSS), pH
- (k) Subpart W—Primary Nickel and
- **Cobalt Subcategory**
- 120. copper
- 124. nickel, cobalt, ammonia (as N), total suspended solids (TSS), pH (1) Subpart X—Secondary Nickel
- Subcategory
  - 119. chromium
- 120. copper
- 124. nickel, total suspended solids (TSS), pH
- (m) Subpart Y—Primary Precious Metals and Mercury Subcategory
  - 115. arsenic
  - 122. lead 123. mercury
  - 126. silver
- 128. zinc, oil and grease, total suspended solids (TSS), pH (n) Subpart Z—Secondary Precious
- Metals Subcategory
- 120. copper
- 121. cyanıde
- 128. zinc, ammonia (as N), total
- suspended solids (TS9), pH (o) Subpart AA-Primary Rare Earth
- Metals Subcategory
- 9. hexachlorobenzene
- 119. chromium (total)
- 122. lead
- 124. nickel, total suspended solids

- (TSS), pH
- (p) Subpart AB-Secondary Tantalum

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- Subcategory 120. copper
- 122. lead
- 124. nickel
- 128. zinc, total suspended solids (TSS), pH
- (q) Subpart AC-Primary and Secondary Tin Subcategory
  - 114. antimony
  - 121. cyanide 122. lead
- 124. nickel, tin, ammonia (as N), fluoride, total suspended solids (TSS), pH
- (r) Subpart AD—Primary and Secondary Titanium Subcategory
- 119. chromium (total)
- 122. lead
- 124. nickel

Subcategory

120. copper

122. lead

Detected

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(TSS), pH

119. chromium (total)

- 127. thallium, titanum, fluoride, oil and grease, total suspended solids (TSS), pH
- (s) Subpart AE-Secondary Tungsten and Cobalt Subcategory 120. copper

124. nickel, cobalt, oil and grease,

solids (TSS), pH (t) Subpart AF—Secondary Uranum

124. nickel, uranium, ammonia,

Hafmum Subcategory

119. chromium (total)

121. cyanide (total)

Subcategory

3. acrylonitrile

chlorobenzene

8. 1,2,4-trichlorobenzene

9. hexachlorobenzene

11. 1,1,1-trichloroethane

10. 1.2-dichloroethane

12. hexachloroethane

13. 1,1-dichloroethane

16. chloroethane

(Deleted)

14. 1,1,2-trichloroethane

20. 2-chloronaphthalene

15. 1,1,2,2-tetrachloroethane

17 Bis(2-chloromethal)ether

18. bis[2-chloroethyl]ether (Deleted)

19. 2-chloroethyl vinyl ether (mixed)

2. acrolem

4. benzene

5. benzidene

fluoride, total suspended solids

(u) Subpart AG-Primary Zirconium and

124. nickel, radium 226, ammonia,

Appendix C-Toxic Pollutants Not

(a) Subpart A—Bauxite Refining

total suspended solids (TSS). pH

ammonia (as N), total suspended

22. para-chloro meta-cresol 25. 1,2-dichlorobenzene 26. 1.3-dichlorobenzene 27 1.4-dichlorobenzene 28. 3,3'-dichlorobenzidene 29. 1,1-dichloroethylene 30. 1.2-trans-dichloroethylene 32. 1,2-dichloropropane 33. 1,3-dichloropropylene (1,3dichloropropene) 35. 2,4-dinitrotoluene 36. 2,6-dinitrotoluene 37 1.2-diphenvlhydrazine 38. ethylbenzene 40. 4-chorophenyl phenyl ether
41. 4-bromophenyl phenyl ether
42. bis(2-chloroisopropyl)ether
43. bis(2-chloroethoxy)methane
45. methyl chloride (chloromethane) 46. methyl bromide (bromomethane) bromoform (tribromomethane) 47 49. Trichlorofluoromethane (Deleted) 50. Dichlorodifluoromethane (Deleted) 51. chlorodibromomethane-52. hexachlorobutadiene 53. hexachlorocyclopentadiene 54. isophorone 56. nitrobenzene 59. 2,4-dinitrophenol 61. N-nitrosodimethylamine 62. N-nitrosodiphenylamine 63. N-nitrosodi-n-propylamine 69. di-n-octyl phthalate 72. benzo(a)anthracene (1,2,benzanthracene) 73. benzo(a)pyrene (3,4benzopyrene) 74. 3,4-benzofluoranthene 75. benzo(k)fluoranthene (11,12benzofluoranthene) 76. chrysene78. anthracene 79. benzo(ghi)perylene (1,12benzoperylene) 81. phenanthrene 82. dibenzo (a,h)anthracene (1,2,5,6dibenzanthracene) 83. ideno (1,2,3-cd)pyrene (2,3,-ophenylenepyrene) 87 trichloroethylene 88. vinyl chloride (chloroethylene) 89. aldrin 90. diedlrin 94. 4,4'-DDD (p,p'TDE) 105. g-BCH-Delta 113. toxaphene 116. asbestos (fibrous) 117 beryllium 118. cadmium\* 119. chromium (total)\* 120. copper\*

- 122. lead
- 123. mercury\*
- 124. nickel\*
- 128. zinc\*
- 129. 2,3,7,8-tetra chlorodibenzo-pdioxin (TCDD)

\*We did not analyze for these pollutants in samples of raw wastewater from this

subcategory. These pollutants are not believed to be present based on the Agency's best engineering judgment which includes consideration of raw materials and process operations. (b) Subpart N-Primary Antimony Subcategory 1. acenaphthene\* 2. acrolein\* 3. acrylonitrile\* 4. benzene\* 5. benzidene\* 6. carbon tetrachloride (tetrachloromethane)\* chlorobenzene\* .7 8. 1,2,4-trichlorobenzene\* 9. hexachlorobenzene\* 10. 1.2-dichloroethane\* 11. 1.1.1-trichloroethane\* 12. hexachloroethane\* 13. 1,1-dichloroethane\* 14. 1.1.2-trichloroethane\* 15. 1,1,2,2-tetrachloroethane\* 16. chloroethane\* 17. bis(2-chloromethyl)ether (Deleted)\* 18. bis(2-chloroethyl)ether\* 19. 2-chloroethyl vinyl ether (mixed)\* 20. 2-chloronaphthalene\* 21. 2,4,6-trichlorophenol\* 22. para-chloro meta-cresol\* 23. chloroform (trichloromethane)\* 24. 2-chlorophenol\* 25. 1,2-dichlorobenzene\* 26. 1,3-dichlorobenzene\* 27 1,4-dichlorobenzene\* 28. 3,3'-dichlorobenzidene\* 29. 1,1-dichloroethylene\* 30. 1,2-trans-dichloroethylene\* 31. 2.4-dichlorophenol\* 32. 1,2-dichloropropane\* 33. 1,3-dichloropropylene (1,3dichloropropene)' 34. 2,4-dimethylphenol\* 35. 2,4-dinitrotoluene\* 36. 2,6-dinitrotoluene 37 1,2-diphenylhydrazine\* 38. ethylbenzene 39. fluoranthene\* 40. 4-chorophenyl phenyl ether\* 41. 4-bromophenyl phenyl ether\* 42. bis(2-chloroisopropyl)ether\* 43. bis(2-chloroethoxy)methane\* 44. methylene chloride (dichloromethane)\* 45. methyl chloride (chloromethane)\* 46. methyl bromide (bromomethane)\* 47 bromoform (tribromomethane)\* 48. dichlorobromomethane\* 49. trichlorofluoromethane (Deleted)\* 50. dichlorodifluoromethane (Deleted)\* 51. chlorodibromomethane\*

52. hexachlorobutadiene\* 53. hexachlorocyclopentadiene\* 54. isophorone\*

55. naphthalene\* 56. nitrobenzene\* 57 2-nitrophenol\* 58. 4-nitrophenol\* 59. 2.4-dinitrophenol\* 60. 4,6-dinitro-o-cresol\* N-nitrosodimethylamine\* 61. 62. N-nitrosodiphenlamine\* N-nitrosodi-n-propylamine\* 63. pentachlorophenol\* 64. 65. phenol\* 66. bis(2-ethylhexyl) phthalate\* butyl-benzyl phthalate\* 67 di-n-butyl phthalate\* 68. di-n-octyl phthalate\* 69. 70. diethyl phthalate\* dimethyl phthalate\* 71. 72. benzo (a) anthracene (1,2benzanthracene)\* 73. benzo (a) pyrene (3,4-benzopyrene)\* 74. 3,4-benzofluoranthene\* 75. benzo (k) fluoranthene (11,12benzofluoranthene)\* 76. chrysene\* acenaphthylene\* 77 78. anthracene\* 79. benzo (ghi) perylene (1,12benzoperylene)\* 80. fluorene\* 81. phenanthrene\* 82. dibenzo (a,h) anthracene (1,2,5,0dibenzanthracene)\* 83. 1deno (1,2,3-cd) pyrene (2,3-ophenylenepyrene)\* 84. pyrene\* tetrachloroethylene\* 85. 86. toluene\* trichloroethylene\* 87 vinyl chloride (chloroethylene)\* 88. 89. aldrin\* dieldrin\* 90. 91. chlordane (technical mixture and metabolites)\* 92. 4,4'-DDT\* 93. 4,4'-DDE (p,p'DDX)\* 94. 4,4'-DDD (pp'TDE)\* 95. a-endosulfan-Alpha\* b-endosulfan-Beta\* 96. 97 endosulfan sulfate\* 98. endrin\* endrin aldehyde\* 99. heptachlor\* 10D. 101. heptachlor epoxide\* 102. a-BHC-Alpha\* 103. b-BHC-Beta\* 104. r-BHC (lindane)-Gamma\* 105. g-BHC-Delta\* 106. PBC-1242 (Arochlor 1242)\* 107 PBC-1254 (Arochlor 1254)\* 108. PBC-1251 (Arochlor 1254)\* 109. PBC-1232 (Arochlor 1232)\* 110. PCB-1248 (Arochlor 1248)\* 111. PCB-1260 (Arochlor 1260)\* 112. PCB-1016 (Arochlor 1016)\* 113. toxaphene'

116. asbestos (fibrous) beryllium\*

117

119. chromium (total)\* 121. cyanide (total)\* 124. nickle\* 125. selenium\* 126. silver\* 127 thallium\* 129. 2,3,7,8-tetra chlorodibenzo-pdioxin (TCDD) \*We did not analyze for these pollutants in samples of raw wastewater from this subcategory. These pollutants are not believed to be present based on the Agency's best engineering judgement which includes consideration of raw materials and process operations. (c) Subpart O-Primary Beryllium Subcategory 1. acenaphthene\* 2. acrolein\* 3. acrylonitrile\* 4. benzene\* 5. benzidene\* 6. carbon tetrachloride (tetrachloromethane)\* chlorobenzene\* 8. 1.2.4-trichlorobenzene\* 9. hexachlorobenzene\* 10. 1,2-dichloroethane 11. 1,1,1-trichloroethane\* 12. hexachloroethane\* 13. 1,1-dichloroethane\* 14. 1,1,2-trichloroethane\* 15. 1,1,2,2-tetrachloroethane\* 16. chloroethane\* 17 bis (2-chloromethyl) ether (Deleted)\* 18. bis(2-chloroethyl) ether\* 19. 2-chloroethyl vinyl ether (mixed)\* 20. 2-chĺoronaphthalene\* 21. 2,4,6-trichlorophenol\* 22. para-chloro meta-cresol\* \_\_\_\_23. chloroform (trichloromethane)\* - 24. 2-chlorophenol\* 25. 1,2-dichlorobenzene\* 26. 1.3-dichlorobenzene\* 27 1,4-dichlorobenzene\* 28. 3,3'-dichlorobenzidene\* 29. 1,1-dichloroethylene\* 30. 1,2-trans-dichloroethylene\* 31. 2,4-dichlorophenol\* 32. 1,2-dichloropropane\* 33. 1,3-dichloropropylene (1,3dichloropropene)\* 34. 2,4-dimethylphenol\* 35. 2.4-dinitrotoluene\* 36. 2,6-dinitrotoluene\* 37 1,2-diphenylhydrazine\* 38. ethylbenzene 39. fluoranthene\* 40. 4-chlorophenyl phenyl ether\* 41. 4-bromophenyl phenyl ether\* 42. bis(2-chloroisopropyl ether)\* 43. bis(2-chloroethoxy) methane\* 44. methylene chloride (dichloromethane)\* 45. methyl chloride (chloromethane)\* 46. methyl bromide

(bromomethane)\* 47 bromoform (tribromomethane)\* 48. dichlorobromomethane\* 49. trichlorofluoromethane (Deleted)\* 50. dichlorodifluoromethane (Deleted)\* 51. chlorodibromomethane\* 52. hexachlorobutadiene\* 53. hexachlorocyclopentadiene\* 54. isophorone\* 55. naphthalene\* 56. nitrobenzene\* 57 2-nitrophenol\* 58. 4-nitrophenol\* 59. 2,4-dinitrophenol\* 60. 4,6-dinitro-o-cresol\* 61. N-nitrosodimethylamone\* 62. N-nitrosodiphenylamine\* 63. N-nitrosodi-n-propylamine\* 64. pentachlorophenol\* 65. phenol\* 66. bis(2-ethylhexyl) phthalate\* 67 butyl benzyl phthalate\* 68. di-n-butyl phthalate\* 69. di-n-octyl phthalate\* 70. diethyl phthalate\*71. dimethyl phthalate\* 72. benzo (a) anthracene (1,2benzanthracene)\* 73. benzo (a) pyrene (3,4benzopyrene) 74. 3,4-benzofluoranthene\* 75. benzo (k) fluoranthene (11,12benzofluoranthene)\* 76. chrysene\* 77 acenaphthylene\* 78. anthracene\* 79. benzo(ghi)perylene (1,12benzoperylene)\* 80. fluorene\* 81. phenanthrene\* 82. dibenzo (a,h)anthracene (1,2,5,6dibenzanthracene)\* 83. ideno (1,2,3-cd)pyrene (2,3,-ophenylenepyrene)\* 84. pyrene\* 85. tetrachloroethylene\* 86. toluene\* 87 trichloroethylene\* vinyl chloride (chloroethylene)\* 89. aldrin 90. dieldrin\* 91. chlordane (technical mixture and metabolites) 92. 4,4'-DDT' 93. 4,4'-DDE (p,p'DDX)\* 94. 4,4'-DDD (p,p'TDE)\* 95. a-endosulfan-Alpha\* 96. b-endosulfan-Beta\* 97 endosulfan sulfate\* 98. endrin\* 99. endrin aldehyde\* 100. heptachlor\* 101. heptachlor epoxide\* 102. a-BHC-Alpha\* 103. b-BHC-Beta\* 104. r-BHC (lindane)-Gamma\* 105. g-BHC-Delta\*

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 (Arachlor 1260)\* 112. PCB-1016 (Arochlor 1016)\* 113. toxaphene\* 116. asbestos (fibrous) 129. 2.3.7.8-tetra chlorodibenzo-pdioxin (TCDD) \*We did not analyze for these pollutants in samples of raw wastewater from this subcategory. These pollutants are not believed to be present based on the Agency's best engineering judgement which includes consideration of raw materials and process operations. (d) Subpart P-Primary Boron Subcategory 1. acenaphthene 2. acrolein 3. acrylonitrile 4. benzene 5. benzidene 6. carbon tetrachloride (tetrachloromethane) 7 chlorobenzene 8. 1.2.4-trichlorobenzene 9. hexachlorobenzene 10. 1,2-dichloroethane 11. 1.1.1-trichloroethane 12. hexachloroethane 13. 1.1-dichloroethane 14. 1,1,2-trichloroethane 15. 1,1,2,2-tetrachloroethane 16. chloroethane 17. bis(2-chloromethyl)ether (Deleted) 18. bis[2-chloroethyl]ether 19. 2-chloroethyl vinyl ether (mixed) 20. 2-chloronaphthalene 21. 2.4,6-trichlorophenol 22. para-chloro meta-cresol 24. 2-chlorophenol 25. 1,2 dichlorobenzene 26. 1,3-dichlorobenzene 27 1.4-dichlorobenzene 28. 3,3'-dichlorobenzidene 29. 1.1-dichloroethylene 30. 1.2-trans-dichloroethylene 31. 2,4-dichlorophenol 32. 1,2-dichloropropane 33. 1,3-dichloropropylene (1,3dichloropropene) 34. 2,4-dimethylphenol 35. 2,4-dinitrotoluene 36. 2.6-dinitrotoluene 37. 1,2-diphenylhydrazine 38. ethylbenzene 39. fluoranthene 40. 4-chlorophenyl phenyl ether 41. 4-bromophenyl phenyl ether 42. bis(2-chloroisopropyl)ether 43. bis(2-chloroethoxy)methane 45. methyl chloride (chloromethane) 46. methyl bromide (bromomethane)

47 bromoform (tribromomethane) 49. trichlorofluoromethane (Deleted) 50. dichlorodifluoromethane (Deleted) 52. hexachlorobutadiene 53. hexachlorocyclopentadiene 54. isophorone 55. naphthalene 56. nitrobenzene 57 2-nitrophenol 58. 4-nitrophenol 59. 2,4-dinitrophenol 60. 4,6-dinitro-o-cresol 61. N-nitrosodimethylamıne 62. N-nitrosodiphenylamine 63. N-nitrosodi-n-propylamine 64. pentachlorophenol 65. phenol 71. dimethyl phthalate 72. benzo(a)anthracene (1.2benzanthracene) 73. benzo(a)pyrene (3,4-benzopyrene) 74. 3,4-benzofluoranthene 75. benzo(k)fluoranthene (11,12benzofluoranthene) 76. chrysene 77 acenaphthylene 78. anthracene 79. benzo(ghi)perylene (1,12benzopervlene) 80. fluorene 81. phenanthrene 82. dibenzo (a,h)anthracene (1,1,5,6dibenzanthracene) 83. ideno (1,2,3-cd)pyrene (2,3,-ophenylenepyrene) 84. pyrene 85. tetrachloroethylene 86. toluene 87 trichloroethylene 88. vinyl chloride (chloroethylene) 89. aldrın 90. dieldrın 91. chlordane (technical mixture and metabolites) 92. 4,4'-DDT 93. 4,4'-DDE (p,p'DDX) 94. 4,4'-DDD (p,p'TDE) 95. a-endosulfan-Alpha 96. b-endosulfan-Beta 97 endosulfan sulfate 98. endrin 99. endrın aldehyde 100. heptachlor 101. heptachlor epoxide 102. a-BHC-Alpha 103. b-BHC-Beta 104. r-BHC (lindane)-Gamma 105. g-BHC-Delta 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 (fibrous)

129. 2,3,7,8-tetra chlorodibenzo-p-

dioxin (TCDD) (e) Subpart Q-Primary Cesium and Rubidium Subcategory 1. acenaphthene\* 2. acrolein' 3. acrylonitrile\* 4. benzene\* 5. benzıdine\* 6. carbon tetrachloride (tetrachloromethane)\* 7 chlorobenzene\* 8. 1,2,4-trichlorobenzene\* 9. hexachlorobenzene\* 10. 1.2-dichloroethane' 11. 1,1,1-trichloroethane\* 12. hexachloroethane\* 13. 1,1-dichloroethane\* 14. 1,1,2-trichloroethane\* 15. 1,1,2,2-tetrachloroethane\* 16. chloroethane\* 17 bis(2-chloromethyl) ether (Deleted)' 18. bis(2-chloroethyl) ether\* 19. 2-chloroethyl vinyl ether (mixed)\* 20. 2-chloronaphthalene\* 21. 2,4,6-trichlorophenol\* 22. para-chloro meta-cresol\* 23. chloroform (trichloromethane)\* 24. 2-chlorophenol\* 25. 1.2-dichlorobenzene\* 26. 1,3-dichlorobenzene\* 27 1,4-dichlorobenzene\* 28. 3.3'-dichlorobenzidene\* 29. 1,1-dichloroethylene\* 30. 1,2-trans-dichloroethylene\* 31. 2,4-dichlorophenol\* 32. 1,2-dichloropropane\* 33. 1,3-dichloropropylene (1,3-dichloropropene)\* 34. 2,4-dimethylphenol\* 35. 2,4-dinitrotoluene\* 36. 2,6-dinitrotoluene\* 37 1,2-diphenylhydrazine\* 38. ethylbenzene 39. fluoranthene\* 40. 4-chlorophenyl phenyl ether\* 41. 4-bromophenyl phenyl ether\* 42. bis(2-chloroisopropyl) ether\* 43. bis(2-chloroethoxy) methane\* 44. methylene chloride (dichloromethane)\* 45. methyl chloride (chloromethane)\* 46. methyl bromide (bromomethane)\* 47 bromoform (tribromomethane)\* 48. dichlorobromomehane\* 49. trichlorofluoromethane (Deleted)\* 50. dichlorodifluoromethane (Deleted) 51. chlorodibromomethane\* 52. hexachlorobutadiene\* 53. hexachlorocyclopentadiene\* 54. isophorone\* 55. naphthalene\* 56. nitrobenzene\* 57 2-nitrophenol\* 58. 4-nitrophenol\* 59. 2,4-dinitrophenol\* 60. 4,6-dinitro-o-cresol\* 61. N-nitrosodimethylamine\*

62. N-nitrosodiphenvlamine\* 63. N-nitrosodi-n-propylamine\* 64. pentachlorophenol\* 65. phenol\* 66. bis(2-ethylhexyl) phthalate\* 67 butylbenzyl phthalate\* 68. di-n-butyl phthalate\* 69. di-n-octyl phthalate\* 70. diethyl phthalate\* 71. dimethyl phthalate\* 72. benzo (a) anthracene (1.2benzanthracene)\* 73. benzo (a) pyrene (3,4benzopyrene)\* 74. 3,4-benzofluoranthene\* 75. benzo(k)fluoranthene (11,12benzofluoranthene)\* 76. chrysene\* 77 acenaphthylene\* 78. anthracene' 79. benzo (ghi) perylene (1,12benzoperylene)\* 80. fluorene\* 81. phenanthrene\* 82. dibenzo (a,h) anthracene (1,2,5.8dibenzanthracene)\* 83. ideno (1,2,3-cd) pyrene (2,3,-ophenylenepyrene)\* 84. pyrene\* 85. tetrachloroethylene\* 86. toluene\* 87 trichloroethylene\* 88. vinyl chloride (chloroethylene)\* 89. aldrin\* 90. dieldrin\* 91. chlordane (technical mixture and metabolites)\* 92. 4,4'-DDT\* 93. 4,4'-DDE (p,p'DDX)\* 94. 4,4'DDD (p,p'TDE) 95. a-endosulfan-Alpha\* 96. b-endosulfan-Beta\* 97 endosulfan sulfate\* 98. endrin\* 99. endrin aldehyde\* 100. heptachlor\* 101. heptachlor epoxide\* 102. a-BHC-Alpha\* 103. b-BHC-Beta\* 104. r-BHC (lindane)-Gamma\* 105. g-BHC-Delta\* 106. PCB-1242 (Arochilor 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 (fibrous) 129. 2,3,7,8-tetra chlorodibenzo-pdioxin (TCDD) \*We did not analyze for these pollutants in samples of raw wastewater from this subcategory. These pollutants are not believed to be present based on the Agency's best engineering judgement

4

67 butyl benzyl phthalate

72. benzo(a)anthracene (1,2-

69. di-n-octyl phthalate

71. dimethyl phthalate

73. benzo(a)pyrene (3,4-

74. 3.4-benzofluoranthene

benzofluoranthene)

acenaphthylene

79. benzo(ghi)perylene (1,12-

75. benzo(k)fluoranthene (11,12-

70. diethyl phthalate

benzanthracene)

benzopyrene)

76. chrysene

80. fluorene

78. anthracene

benzoperylene)

81. phenanthrene

77

which includes consideration of raw materials and process operations. (f) Subpart R-Primary and Secondary Germanium and Gallium Subcategory 1. acenaphthene 2. acrolein 3. acrylonitrile 5. benzıdene 6. carbon tetrachloride (tetrachloromethane) 7 chlorobenzene 8.1.2.4-trichlorobenzene 10. 1,2-dichloroethane 11. 1.1.1-trichloroethane 12. hexachloroethane 13. 1,1-dichloroethane 14. 1.1.2-trichloroethane 15. 1.1.2.2-tetrachloroethane 16. chloroethane 17 bis (2-chloromethyl) ether (Deleted) 18. bis (2-chloroethyl) ether 19. 2-chloroethyl vinyl ether (mixed) 20. 2-chloronaphthalene 22. para-chloro meta-cresol 24. 2-chlorophenol 25. 1,2-dichlorobenzene 26. 1.3-dichlorobenzene 27 1.4-dichlorobenzene 28. 3,3'-dichlorobenzidene 29. 1,1-dichloroethylene 30. 1.2-trans-dichloroethylene 31. 2,4-dichlorophenol 32. 1,2-dichloropropane 33. 1,3-dichloropropylene (1,3dichloropropene) 34. 2.4-dimethylphenol 35. 2,4-dinitrotoluene 36. 2.6-dinitrotoluene 37 1.2-diphenylhydrazine 38. ethylbenzene 39. fluoranthene 40. 4-chlorophenyl phenyl ether 41. 4-bromophenyl phenyl ether 42. bis(2-chloroisopropyl) ether 43. bis(2-chloroethoxy)methane 45. methyl chloride (chloromethane) 46. methyl bromide (bromomethane) bromoform (tribromomethane) 47 48. dichlorobromomethane 49. trichlorofluoromethane (Deleted) 50. dichlorodifluoromethane (Deleted) 51. Chlorodibromomethane 52. hexachlorobutadiene 53. hexachlorocyclopentadiene 54. isophorone 55. naphthalene 56. nitrobenzene 57 2-nitrophenol 58. 4-nitrophenol 59. 2,4-dinitrophenol 60. 4,6-dinitro-o-cresol 61. N-nitrosodimethylamine 62. N-nitrosodiphenylamine

63. N-nitrosodi-n-propylamine

65. phenol

82. dibenzo (a,h)anthracene (1,2,5,6dibenzanthracene) 83. ideno (1,2,3-cd)pyrene (2,3,-ophenylenepyrene) 84. pyrene 85. tetrachloroethylene 86. toluene 88. vinyl chloride (chloroethylene) 89. aldrın 90. dieldrın 91. chlordane (technical mixture and metabolites) 92. 4,4'-DDT 93. 4,4'-DDE (p,p'DDX) 94. 4,4'-DDD (p,p'TDE) 95. a-endosulfan-Alpha 96. b-endosulfan-Beta 97 endosulfan sulfate 98. endrin 99. endrin aldehvde 100. heptachlor 101. heptachlor epoxide 102. a-BHC-Alpha 103. b-BHC-Beta 104. r-BHC (lindane)-Gamma 105. g-BHC-Delta 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 (fibrous) 129. 2,3,7,8-tetra chlorodibenzo-pdioxin (TCDD) (g) Subpart S-Secondary Indium Subcategory 1. acenaphthene 2. acrolein 3. acrylonitrile 4. benzene 5. benzidene 6. carbon tetrachloride (tetrachloromethane) chlorobenzene 1,2,4-trichlorobenzene 8. 9. hexachlorobenzene 10. 1,2-dichloroethane 11. 1,1,1-trichloroethane

12. hexachloroethane 13. 1.1-dichloroethane 14. 1.1.2-trichloroethane 15. 1,1,2,2-tetrachloroethane 16. chloroethane 17 bis[2-chloromethyl]ether (Deleted) 18. bis(2-chloroethyl)ether 19. 2-chloroethyl vinyl ether (mixed) 20. 2-chloronaphthalene 21. 2,4,6-trichlorophenol 22. para-chloro meta-cresol 23. chloroform (trichloromethane) 24. 2-chlorophenol 25. 1,2-dichlorobenzene 26. 1.3-dichlorobenzene 27 1.4-dichlorobenzene 28. 3,3'-dichlorobenzidene 29. 1.1-dichloroethylene 30. 1.2-trans-dichloroethylene 31. 2,4-dichlorophenol 32. 1.2-dichloropropane 33. 1,3-dichloropropylene (1,3dichloropropene) 34. 2.4-dimethylphenol 35. 2.4-dinitrotoluene 36. 2,6-dinitrotoluene 37. 1.2-diphenvlhvdrazine 38. ethvlbenzene 39. fluoranthene 40. 4-chlorophenyl phenyl ether 41. 4-bromophenyl phenyl ether 42. bis(2-chloroisopropyl)ether 43. bis(2-chloroethoxy)methane 45. methyl chloride (chloromethane) 46. methyl bromide (bromomethane) bromoform (tribromomethane) 47 48. dichlorobromomethane 49. trichlorofluoromethane (Deleted) 50. dichlorodifluoromethane (Deleted) 51. chlorodibromomethane 52. hexachlorobutadiene 53. hexachlorocyclopentadiene 54. isophorone 55. naphthalene 56. nitrobenzene 57 2-nitrophenol 58. 4-nitrophenol 59. 2.4.-dinitrophenol 60. 4,6-dinitro-o-cresol 61. N-nitrosodimethylamine 62. N-nitrosodiphenylamine 63. N-nitrosodi-n-propylamine 66. bis(2-ethylhexyl) phthalate 67 butyl benzyl phthalate 69. di-n-octyl phthalate 72. benzo(a)anthracene (1,2benzanthracene) 73. benzo(a)pyrene (3, 4benzopyrene) 74. 3,4-benzofluoranthene 75. benzo{k)fluoranthene (11,12benzofluoranthene) 76. chrysene 77 acenaphthylene 78. anthracene 79. benzo(ghi)perylene (1,12-

benzopervlene) 80. fluorene 81. phenanthrene 82. dibenzo (a,h)anthracene (1,2,5,6dibenzanthracene) 83. indeno (1,2,3-cd)pyrene (2,3,-ophenylenepyrene) 84. pyrene 85. tetrachloroethylene 86. toluene 87 trichloroethylene 88, vinyl chloride (chloroethylene) 89. aldrin 90. dieldrin 91. chlordane (technical mixture and metabolites) 92. 4,4'-DDT 93. 4,4'-DDE(p,p'DDX) 94. 4,4'-DDD(p,p'TDE) 95. a-endosulfan-Alpha 96. b-endosulfan-Beta 97 endosulfan sulfate 98. endrin 99. endrin aldehyde 100. heptachlor 101. heptachlor epoxide 102. a-BHC-Alpha 104. r-BHC (lindane)-Gamma 105. g-BHC-Delta 106. PCB-1242 (Arochlor 1242) 107 PCB-1254 (Arochlor 1254)
108 PCB-1251 (Arochlor 1254)
109 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 (fibrous) 129. 2,3,7;8-tetra chlorodibenzo-pdioxin (TCDD) (h) Subpart T-Secondary Mercury Subcategory 1. acenaphthene\* 2. acrolein\* 3. acrylonitrile\* 4. benzene\* 5. benzidene\* 6. carbon tetrachloride (tetrachloromethane)\* chlorobenzene\* 8. 1,2,4-trichlorobenzene\* 9. hexachlorobenzene\* 10. 1,2,4-dichloroethane\* 11. 1,1,1-trichloroethane\* 12. hexachloroethane\* 13. 1,1-dichloroethane\* 14. 1,1,2-trichloroethane\* °15. 1,1,2,2-tetrachloroethane\* 16. chloroethane\* 17 bis(2-chloromethyl)ether (Deleted) 18. bis(2-chloroethyl)ether\* 19. 2-chloroethyl vinyl ether (mixed)\*

- 20. 2-chloronaphthalene\*
- 21. 2,4,6-trichlorophenol\*
- 22. para-chloro meta-cresol\*
- 23. chloroform (trichloromethane)\*
- 24. 2-chlorophenol\*

25. 1,2-dichlorobenzene\* 26. 1.3-dichlorobenzene\* 27 1,4-dichlorobenzene\* 28. 3,3'-dichlorobenzidene\* 29. 1,1-dichloroethylene\* 30. 1,2-trans-dichloroethylene\* 31. 2,4-dichlorophenol\* 32. 1,2-dichloropropane\* 33. 1,3-dichloropropylene (1,3-dichloropropene)\* 34. 2,4-dimethylphenol\* 35. 2,4-dinitrotoluene\* 36. 2,6-dinitrotoluene\* 37 1,2-diphenylhydrazine\*38. ethylbenzene\* 39. fluoranthene\* 40. 4-chlorophenyl phenyl ether\*
41. 4-bromophenyl phenyl ether\*
42. bis(2-chloroisopropyl)ether\* 43. bis(2-chlorethoxy)methane\* 44. methylene chloride (dichloromethane)\* 45. methyl chloride (chloromethane)\* 46. methyl bromide (bromomethane)\* 47 bromoform (tribromomethane)\* 48. dichlorobromomethane\* 49. trichlorofluoromethane (Deleted)\* 50. dichlorodifluoromethane (Deleted)\* 51. chlorodibromomethane\* 52. hexachlorobutadiene\* 53. hexachlorocyclopentadiene\* 54. isophorone\* 55. naphthalene\* 56. nitrobenzene\* 57 2-nitrophenol\* 58. 4-nitrophenol\* 59. 2,4-dinitrophenol\* 60. 4,6-dinitro-o-cresol\* 61. N-nitrosodimethylamine\* 62. N-nitrosodiphenylamine\* 63. N-nitrosodi-n-propylamine\* 64. pentachlorophenol\* 65. phenol\*
66. bis(2-ethylhexyl) phthalate\*
67 butyl benzyl phthalate\* 68. di-n-butyl phthalate\* 69. di-n-octyl phthalate\* 70. diethyl phthalate\* \* \* 71. dimethyl phthalate benzanthracene)\* 73. benzo(a)pyrene (3,4benzopyrene)\* 74. 3,4-benzofluoranthene\* 75. benzo(k)fluoranthene (11,12benzofluoranthene)\* 76. chrysene\* 77 acenaphthylene\* 78. anthracene\* 79. benzo(ghi)perylene (1,12benzoperylene)\* 80. fluorene\* 81. phenanthrene\* 82. dibenzo (a,h)anthracene (1,2,5,6dibenzanthracene)\*

83. ideno (1,2,3-cd)pyrene (2,3,-o-

trichloroethylene\* 87 88. vinyl chloride (chloroethylene)\* 89. aldrın\* 90. dieldrin\* 91. chlordane (technical mixture and metabolites) 92. 4,4'-DDT\* 93. 4,4'-DDE (p,p'DDX)\* 94. 4,4'-DDD (p,p'TDE)\* 95. a-endosulfan-Alpha\* 96. b-endosulfan-Beta\* 97 endosulfan-sulfate\* 98. endrin\* 99. endrin aldehyde\* 100. heptachlor\* 101. heptachlor epoxide\* 102. a-BHC-Alpha\* 103. b-BHC-Beta\* 104. r-BHC (lindane)-Gamma\* 105. g-BHC-Delta\* 106. PCB-1242 (Arochlor 1242)\* 107 PCB-1254 (Arochlor 1254)\* 108. PCB-1221 (Arochlor 1221)\* 100. 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 (fibrous) 121. cyanıde (total)\* 129. 2,3,7,8-tetra chlorodibenzo-p-dioxin (TCDD) \*We did not analyze for these pollutants in samples of raw wastewater from this subcategory. These pollutants are not believed to be present based on the Agency's best engineering judgement which includes consideration of raw materials and process operations. (i) Subpart U-Primary Molybdenum. and Rhenium Subcategory 1. acenaphthene 2. acrolein . . . ما يو 3. aciylonitrile , 4. benzene , AF 1 benzidene 5. carbon tetrachloride 6. (tetrachloromethane) chlorobenzene 8. 1,2,4,-trichlorobenzene 9. hexachlorobenzene 10. 1,2-dichloroethane 11. 1,1,1-trichloroethane 12. hexachloroethane 13. 1,1-dichloroethane 14. 1,1,2-trichloroethane 15. 1,1,2,2-tetrachloroethane 16. chloroethane 17 bis(2-chloromethyl) ether (Deleted) 18. bis(2-chloroethyl) ether

phenylenepyrene)\*

85. tetrachloroethylene\*

84. pyrene\*

86. toluene\*

19. 2-chloroethyl vinyl ether (mixed) 20. 2-chloronaphthalene 21. 2,4,6-trichlorophenol 22. para-chloro meta-cresol 23. chloroform (trichloromethane) 24. 2-chlorophenol 25. 1,2-dichlorobenzene 26. 1.3-dichlorobenzene 27 1.4-dichlorobenzene 28. 3,3-dichlorobenzidene 29. 1,1-dichloroethylene 30. 1.2-trans-dichloroethylene 31. 2,4-dichlorophenol 32. 1,2-dichloropropane 33. 1.3-dichloropropylene (1,3dichloropropene) 34. 2,4-dimethylphenol 35. 2,4-dinitrotoluene 36. 2,6-dinitrotoluene 37 1,2-diphenylhydrazine 38. ethylbenzene 39. fluoranthene 40. 4-chlorophenyl phenyl ether
41. 4-bromophenyl phenyl ether
42. bis(2-chloroisopropyl) ether 43. bis(2-chloroethoxy) methane
45. methyl chloride (chloromethane) 46. methyl bromide (bromomethane) 47 bromoform (tribromomethane) 48. dichlorobromomethane 49. trichlorofluoromethane (Deleted) 50. dichlorodifluoromethane (Deleted) 51. chlorodibromomethane 52. hexachlorobutadiene 53. hexachlorocyclopentadiene 54. isophorone 55. naphthalene 56. nitrobenzene 57. 2-nitrophenol 58. 4-nitrophenol 59. 2.4-dinitrophenol 60. 4,6-dinitro-o-cresol 61. N-nitrosodimethylamine 62. N-nitrosodiphenylamine 63. N-nitrosodi-n-propylamine 64. pentachlorophenol 65. phenol 66. bis(2-ethylhexyl) phthalate 67 butyl benzyl phthalate 68. di-n-butyl phthalate 69. di-n-octyl phthalate 70. diethyl phthalate 71. dimethyl phthalate 72. benzo (a) anthracene (1,2benzanthracene) 73. benzo (a) pyrene (3,4benzopyrene) 74. 3,4-benzofluoranthene 75. benzo (k) fluoranthene (11,12benzofluoranthene) 76. chrysene 77 acenaphthylene. 78. anthracene 79. benzo (ghi) perylene (1,2benzoperylene) 80. fluorene

81. phenanthrene

12

- 82. dibenzo (a,h) anthracene (1,2,5,6dibenzanthracene)
- 83. ideno (1,2,3-cd) pyrene (2,3 -o-

phenylenepyrene) 84. pyrene 85. tetrachloroethylene 86. toluene 87 trichloroethylene 88. vinyl chloride (chloroethylene) 89. aldrin 90. dieldrin 91. chlordane (technical mixture and metabolites) 92. 4,4'-DDT 93. 4.4'-DDE (p.p'DDX) 94. 4.4'-DDD (p.p'TDE) 95. a-endosulfan-Alpha 96. b-endosulfan-Beta endosulfan sulfate 97 98. endrin 99. endrin aldehyde 100. heptachlor 101. heptachlor epoxide 102. a-BHC-Alpha 103. b-BHC-Beta 105. g-BHC-Delta 106. PCB-1242 (Arochlor 1242) 106. PCB-1242 [Arochlot 1252]
107 PCB-1254 (Arochlor 1254)
108. PCB-1221 (Arochlor 1221)
109. PCB-1232 (Arochlor 1232)
110. PCB-1248 (Arochlor 1248)
110. PCB-1248 (Arochlor 1248) 111. PCB-1260 (Arochlor 1260) 112. PCB-1016 (Arochlor 1016) 113. toxaphene 116. asbestos (fibrous) 129. 2,3,7,8-chlorodibenzo-p-dioxin (TCDD) (j) Subpart V-Secondary Molybdenum and Vanadium Subcategory 1. acenaphthene\* 2. acrolein\* 3. acrylonitrile\* 4. benzene\* 5. benzidene\* 6. carbon tetrachloride (tetrachloromethane)\* 7 chlorobenzene\* 8. 1,2,4-trichlorobenzene\* 9. hexachlorobenzene\* 10. 1.2-dichloroethane\* 11. 1,1,1-trichloroethane\* 12. hexachloroethane\* 13. 1,1-dichloroethane 14. 1,1,2-trichloroethane\* 15. 1,1,2,2-tetrachloroethane\* 16. chloroethane\* 17 bis(2-chloromethyl)ether (Deleted) 18. bis(2-chloroethyl)ether\* 19. 2-chloroethyl vinyl ether (mixed) 20. 2-chloronaphthalene" 21. 2,4,6-trichlorophenol\* 22. para-chloro meta-cresol\* 23. chloroform (trichloromethane)\* 24. 2-chlorophenol\* 25. 1,2-dichlorobenzene\* 26. 1,3-dichlorobenzene\* 27. 1,4-dichlorobenzene\* 28. 3.3'-dichlorobenzidene\* 29. 1,1-dichloroethylene\*

30. 1.2-trans-dichloroethylene\*

31. 2.4-dichlorophenol\* 32. 1,2-dichloropropane\* 33. 1.3-dichloropropylene {1,3dichloropropene)\* 34. 2.4-dimethylphenol\* 35. 2.4-dinitrotoluene\* 36. 2.6-dinitrotoluene\* 37 1.2-diphenylhydrozme\* 38. ethylbenzene\* 39. fluoranthene\* 40. 4-chlorophenyl phenyl ether\* 41. 4-bromophenyl phenyl ether\* 42. bis[2-chloroisopropyl]ether\* 43. bis(2-chloroethoxy)methane\* 44. methylene chloride (dichloromethane)\* 45. methyl chloride (chloromethane)\* 46. methyl bromide (bromomethane)\* 47 bromoform (tribromomethane)\* 48. dichlorobromomethane\* 49. trichlorofluoromethane (Deleted)\* 50. dichlorodifluoromethane (Deleted)\* 51. chlorodibromomethane\* 52. hexachlorobutadiene\* 53. hexachlorocyclopentadiene\* 54. isophorone\* 55. naphthalene\* 56. nitrobenzene\* 2-nitrophenol\* 57 58. 4-nitrophenol\* 59. 2.4-dinitrophenol\* 60. 4,6-dinitro-o-cresol\* 61. N-nitrosodimethylamine\* 62. N-nitrosodiphenylamine\* 63. N-nitrosodi-n-propylamine\* 64. pentachlorophenol\* 65. phenol\* 66. bis(2-ethylhexyl) phthalate\* 67. butyl benzyl phthalate\* 68. di-n-butyl phthalate\* 69. di-n-octyl phthalate\* 70. diethyl phthalate\* 71. dimethyl phthalate\* 72. benzo(a)anthracene (1,2benzanthracene)\* 73. benzo(a)pyrene (3,4benzopyrene]\* 74. 3.4-benzofluoranthene\* 75. benzo(k)fluoranthene (11,12benzofluoranthene)\* 76. chrysene\* 77. acenaphthylene\* 78. anthracene\* 79. benzo(ghi)perylene (1,12-benzoperylene)\* 80. fluorene\* 81. phenanthrene\* 82. dibenzo (a,h)anthracene (1,2,5,6debenzanthracene)\* 83. ideno (1,2,3-cd)pyrene (2,3,-ophenylenepyrene)\* 84. pyrene\* 85. tetrachloroethylene\* 88. toluene\*

87. trichloroethylene\*

88. vinyl chloride (chloroethylene)\* 89. aldrin' 90. dieldrin\* 91. chlordane (technical mixture and metabolites)\* 92. 4,4'-DDT\* 93. 4,4'-DDE (p,p'DDX)\* 94. 4,4'-DDD (p,p'TDE)\* 95. a-endosulfan-Alpha\* 96. b-endosulfan-Beta\* 97 endosulfan sulfate\* 98. endrin\* 99. endrin aldehvde\* 100. heptachlor\* 101. heptachlor epoxide\* 102. a-BHC-Alpha\* 103. b-BHC-Beta\* 104. r-BHC (lindane)-Gamma\* 105. g-BHC-Delta\* 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 (fibrous) 121. cyanide (total)\* 125. selenium\* 126. silver\* 127 thallium\* 129. 2,3,7,8-tetra chlorodibenzo-pdioxin (TCDD) \*We did not analyze for these pollutants in samples of raw wastewater from this subcategory. These pollutants are not believed to be present based on the Agency's best engineering judgement which includes consideration of raw materials and process operations. (k) Subpart W—Primary Nickel and Cobalt Subcategory 1. acenaphthene 2. acrolein 3. acrylonitrile

- 5. benzidene
- carbon tetrachloride
- (tetrachloromethane)
- 7 chlorobenzene
- 8. 1,2,4-trichlorobenzene
- 9. hexachlorobenzene
- 10. 1,2-dichloroethane
- 11. 1,1,1-trichloroethane
- 12. hexachloroethane
- 13. 1,1-dichloroethane
- 14. 1,1,2-trichloroethane
- 15. 1,1,2,2-tetrachloroethane
- 16. chloroethane
- 17 bis(2-chloromethyl)ether (Deleted)
- 18. bis(2-chloroethyl)ether
- 19. 2-chloroethyl vinyl ether (mixed)
- 20. 2-chloronaphthalene
- 21. 2,4,6-trichlorophenol
- 22. para-chloro meta-cresol
- 23. chloroform (trichloromethane)
- 24. 2-chlorophenol

25. 1,2-dichlorobenzene 26. 1.3-dichlorobenzene 27 1,4-dichlorobenzene 28. 3.3'-dichlorobenzene 29. 1,1-dichloroethylene 30. 1.2-trans-dichloroethylene 31. 2,4-dichlorophenol 32. 1,2-dichloropropane 33. 1,3-dichloropropylene (1,3dichloropropene) 34. 2,4-dimethylphenol 35. 2,4-dinitrotoluene 36. 2.6-dinitrotoluene 37 1,2-diphenylhydrazine 38. ethylbenzene 39: fluoranthene 40. 4-chlorophenyl phenyl ether
41. 4-bromophenyl phenyl ether
42. bis(2-chloroisopropyl)ether 43. bis(2-chloroethoxy)methane 44. methylene chloride (dichloromethane) 45. methyl chloride (chloromethane) 46. methyl bromide (bromomethane) bromoform (tribromomethane) 47 dichlorobromomethane 48. 49. trichlorofluoromethane (Deleted) 50. dichlorodifluoromethane (Deleted) 51. chlorodibromomethane 52. hexachlorobutadiene 53. hexachlorocyclopentadiene 54. isophorone 55. naphthalene 56. nitrobenzene 57 2-nitrophenol 58. 4-nitrophenol 59. 2,4-dinitrophenol 60. 4,6-dinitro-o-cresol 61. N-nitrosodimethylamine 62. N-nitrosodiphenylamine 63. N-nitrosodi-n-propylamine 64. pentachlorophenol 65. phenol 67 butyl benzyl phthalate 68. di-n-butyl phthalate 69. di-n-octyl phthalate 70. diethyl phthalate 71. dimethyl phthalate 72. benzo(a)anthracene (1,2benzanthracene) 73. benzo(a)pyrene (3,4benzopyrene) 74. 3,4-benzofluoranthene 75. benzo(k)fluoranthene (11,12benzofluoranthene) 76. chrysene 77 acenaphthylene 78. anthracene 79. benzo(ghi)perylene (1,12benzoperylene) 80. fluorene 81. phenanthrene 82. dibenzo (a,h)anthracene (1,2,5,6dibenzanthracene) 83. ideno (1,2,3-cd)pyrene (2,3-ophenylenepyrene) 84. pyrene

85. tetrachloroethylene

88. vinyl chloride (chloroethylene) 89. aldrin 90. dieldrin 91. chlordane (technical mixture and metabolites) 92. 4,4'-DDT 93. 4,4'-DDE (p,p'DDX) 94. 4,4'-DDD (p,p'TDE) 95. a-endosulfan-Alpha 96. b-endosulfan-Beta 97 endosulfan sulfate 98. endrin 99. endrin aldehyde 100. heptachlor 101. heptachlor epoxide 102. a-BHC-Alpha 103. b-BHC-Beta 104. r-BHC (lindane)-Gamma 105. g-BHC-Delta 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 (fibrous) 121. cyanide\* 129. 2,3,7,8-tetra chlorodibenzo-pdioxin (TCDD) \* We did not analyze for this pollutant in samples of raw wastewater from this subcategory. These pollutants are not believed to be present based on the Agency's best engineering judgment which includes consideration of raw materials and process operations. (I) Subpart X—Secondary Nickel Subcategory 1. acenaphthene\* 2. acrolein\* 3. acrylonitrile\* 4. benzene\* 5. benzidene\* 6. carbon tetrachloride (tetrachloromethane)\* chlorobenzene\* 8. 1,2,4-trichlorobenzene\* 9. hexachlorobenzene\* 10. 1,2-dichloroethane\* 11. 1,1,1-trichloroethane\* 12. hexachloroethane\* 13. 1,1-dichloroethane\* 14. 1.1.2-trichloroethane\* 15. 1,1,2,2-tetrachloroethane\* 16. chloroethane\* 17 bis(2-chloromethyl)ether (Deleted)\* 18. bis(2-chloroethyl)ether\* 19. 2-chloroethyl vinyl ether (mixed)\* 20. 2-chloronaphthalene\*

87 trichloroethylene

- 21. 2,4,6-trichlorophenol\*
- 22. para-chloro meta-cresol\*
- 23. chloroform (trichloromethane)\*

я

24. 2-chlorophenol\* 25. 1,2-dichlorobenzene\* 26 1.3-dichlorobenzene\* 27 1,4-dichlorobenzene\* 28. 3,3'-dichlorobenzidene\* 29. 1,1-dichloroethylene\* 30. 1.2-trans-dichloroethylene\* 31. 2.4-dichlorophenol\* 32. 1,2-dichloropropane\* 33. 1.3-dichloropropylene (1,3dichloropropene)\* 34. 2,4-dimethylphenol\* 35. 2,4-dinitrotoluene\* 36. 2.6-dinitrotoluene\* 37 1,2-diphenylhydrazine\* 38. ethylbenzene\* 39. fluoranthene\* 40. 4-chlorophenyl phenyl ether\*41. 4-bromophenyl phenyl ether\* 42. bis[2-chloroisopropyl]ether\* 43. bis(2-chloroethoxy)methane\* 44. methylene chloride (dichloromethane)\* 45. methyl chloride (chloromethane)\* 46. methyl bromide (bromomethane)\* 47 bromoform (tribromomethane)\* 48. dichlorobromomethane\* 49. trichlorofluoromethane (Deleted)\* 50. dichlorodifluoromethane (Deleted)\* 51. chlorodibromomethane\* 52. hexachlorobutadiene\* 53. hexachlorocyclopentadiene\* 54. isophorone\* 55. naphthalene\* 56. nitrobenzene\* 57. 2-nitrophenol\* 58. 4-nitrophenol\* 59. 2,4-dinitrophenol\* 60. 4,6-dinitro-o-cresol\* 61. N-nitrosodimethylamine\* 62. N-nitrosodiphenylamine\* 63. N-nitrosodi-n-propylamine\* 64. pentachlorophenol\* 65. phenol\* 66. bis(2-ethylhexyl) phthalate\* butyl benzyl phthalate\* 67 68. di-n-butyl phthalate\* 69. di-n-octyl phthalate\* 70. diethylphthalate\* 71. dimethyl phthalate\* 72. benzo(a)anthracene (1,2benzanthracene)\* 73. benzo(a)pyrene (3,4benzopyrene)\* 74. 3,4-benzofluoranthene\* 75. benzo(k)fluoranthene (11,12benzofluoranthene)\* 76. chrysene\* 77 acenaphthylene\* 78. anthracene\* 79. benzo(ghi)perylene (1,12benzoperylene)\*

- 80. fluorene\*
- 81. phenanthrene\*
- 82. dibenzo (a,h)anthracene (1,2,5,6dibenzanthracene)\*

83. ideno (1,2,3-cd)pyrene (2,3-ophenylenepyrene)\* 84. pyrene\* 85. tetrachloroethylene\* 86. toluene\* trichloroethylene\* 87 88. vinvl chloride (chloroethylene)\* 89. aldrin\* 90. dieldrin' 91. chlordane (technical mixture and metabolites)\* 92. 4,4'-DDT 93. 4,4'-DDE (p,p'DDX)\* 94. 4,4'-DDD (p,p'TDE)\* 95. a-endosulfan-Alpha\* 96. b-endosulfan-Beta\* 97 endosulfan sulfate\* 98. endrin\* 99. endrin aldehyde\* 100. heptachlor 101. heptachlor epoxide\* 102. a-BHC-Alpha\* 103. b-BHC-Beta\* 104. r-BHC (lindane)-Gamma\* 105. g-BHC-Delta\* 106. PCB-1242 (Arochlor 1242)\* 107 PCB-1254 (Arochlor 1254)\* 108. PCB-1221 (Arochlor 1221) 109. PCB-1222 (Arochlor 1232)\* 110. PCB-1248 (Arochlor 1248)\* 111. PCB-1260 (Arochlor 1260)\* 112. PCB-1016 (Arochlor 1016)" 113. toxaphene\* 116. asbestos (fibrous) 129. 2,3,7,8-tetra chlorodibenzo-pdioxin (TCDD) \*We did not analyze for these pollutants in samples of raw wastewater from this subcategory. These pollutants are not believed to be present based on the Agency's best engineering judgement which includes consideration of raw materials and process operations. (m) Subpart Y-Primary Precious Metals and Mercury Subcategory 1. acenaphthene 2. acrolein 3. acrylonitrile 5. benzidene 6. carbon tetrachloride (tetrachloromethane) chlorobenzene 8. 1.2.4-trichlorobenzene 9. hexachlorobenzene 10. 1,2-dichloroethane 11. 1,1,1-trichloroethane 12. hexachloroethane 13. 1,1-dichloroethane 14. 1,1,2-trichloroethane 15. 1,1,2,2-tetrachloroethane 16. chloroethane 17 bis[2-chloromethyl]ether (Deleted) 18. bis(2-chloroethyl)ether 19. 2-chloroethyl vinyl ether (mixed) 20. 2-chloronaphthalene 21. 2,4,6-trichlorophenol 22. para-chloro meta-cresol

23. chloroform 24. 2-chlorophenol 25. 1.2-dichlorobenzene 26. 1,3-dichlorobenzene 1,4-dichlorobenzene 27 28, 3,3'-dichlorobenzidene 29. 1.1-dichloroethylene 30. 1.2-trans-dichloroethylene 31. 2.4-dichlorophenol 32. 1.2-dichloropropane 33. 1.3-dichloropropylene (1,3dichloropropene) 34. 2.4-dimethylphenol 35. 2,4-dinitrotoluene 36. 2.6-dinitrotoluene 37 1,2-diphenylhydrazine 38. ethylbenzene 39. fluoranthene 40. 4-chlorophenyl phenyl ether 41. 4-bromophenyl phenyl ether 42. bis(2-chloroisopropyl)ether 43. bis[2-chloroethoxy]methane 45. methyl chloride (chloromethane) 46. methyl bromide (bromomethane) bromoform (tribromomethane) 47 48. dichlorobromomethane 49. trichlorofluoromethane (Deleted) 50. dichlorodifluoromethane (Deleted) 51. chlorodibromomethane 52. hexachlorobutadiene 53. hexachlorocyclopentadiene 54. isophorone 55. naphthalene 56. nitrobenzene 57. 2-nitrophenol 58. 4-nitrophenol 59. 2.4-dinitrophenol 60. 4,6-dinitro-o-cresol 61. N-nitrosodimethylamine 62. N-nitrosodiphenylamine 63. N-nitrosodi-n-propylamine 64. pentachlorophenol 67. butyl benzyl phthalate 69. di-n-octyl phthalate 71. dimethyl phthalate 72. benzo(a)anthracene (1,2benzanthracene) 73. benzo(a)pyrene (3,4benzopyrene) 74. 3.4-benzofluoranthene 75. benzo(k)fluoranthene (11,12benzofluoranthene) 76. chrysene 77 acenaphthylene 79. benzo(ghi)perylene (1,12benzoperylene) 80. fluorene 81. phenanthrene 82. dibenzo (a,h)anthracene (1,2,5,6dibenzanthracene) 83. ideno (1,2,3,-cd)pyrene (2,3,-ophenylenepyrene) 84. ругеле 85. tetrachlorethylene 87. trichloroethylene 88. vinyl chloride (chlorethylene) 89. aldrın

26410 90. dieldrın 91., chlordane (technical mixture and metabolites) 92. 4,4'-DDT 93. 4,4'-DDE (p,p'DDX) 94. 4,4'-DDD (p,p'TDE) 95. a-endosulfan-Alpha 96. b-endosulfan-Beta 97 endosulfan sulfate 98. endrin 99. endrin aldehyde 100. heptachlor 101. heptachlor epoxide 102. a-BHC-Alpha 103. b-BHC-Beta 104. r-BHC (lindane)-Gamma 105. g-BHC-Delta 106. PCB-1242 (Arochlor 1242) 107 PCB-1254 (Arochlor 1254) 108. PCB-1221 (Arochlor 1221) 100. PCB-1232 (Arochlor 1232)
100. PCB-1232 (Arochlor 1232)
110. PCB-1248 (Arochlor 1248)
111. PCB-1260 (Arochlor 1260) 112. PCB-1016 (Arochlor 1016) 113. toxaphene 116. asbestos (fibrous) 129. 2,3,7,8-tetra chlorodibenzo-pdioxin (TCDD) (n) Subpart Z-Secondary Precious Metals Subcategory 1. acenaphthene 2. acrolein 3. acrylonitrile 5. benzidene 8. 1,2,4,-trichlorobenzene 9. hexachlorobenzene 12. hexachloroethane 13. 1.1-dichloroethane 14. 1,1,2-trichloroethane 15. 1,1,2,2-tetrachloroethane 16. chloroethane 17 bis{2-chloromethyl}ether (Deleted) 18. bis(2-chloroethyl)ether 19. 2-chloroethyl vinyl ether (mixed) 20. 2-chloronaphthalene 22. para-chloro meta-cresol 25. 1,2-dichlorobenzene 26. 1,3-dichlorobenzene 27 1,4-dichlorobenzene 28. 3,3'-dichlorobenzidene

- 29. 1,1-dichloroethylene
- 30. 1,2-trans-dichloroethylene
- 31. 2,4-dichlorophenol
- 32. 1,2-dichloropropane
- 33. 1,3-dichloropropylene (1,3-
- dichloropropene)
- 35. 2,4-dinitrotoluene
- 36. 2,6-dinitrotoluene
- 37 1,2-diphenylhydrazine
- 38. ethylbenzene
- 39. fluoranthene
- 40. 4-chlorophenyl phenyl ether
- 41 4-bromophenyl phenyl ether
- 42. bis(2-chloroisopropyl)ether
- 43. bis(2-chloroethoxy)methane
- 45. methyl chloride (chloromethane)
- 46. methyl bromide (bromomethane) 49. trichlorofluoromethane (Deleted)

50. dichlorodifluoromethane (Deleted) 52. hexachlorobutadiene 53. hexachlorocyclopentadiene 55. naphthalene 56. nitrobenzene 58. 4-nitrophenol 59. 2,4-dinitrophenol 60. 4,6-dinitro-o-cresol 61. N-nitrosodimethylamine 63. N-nitrosodi-n-propylamine 64. pentachorophenol 67 butyl benzyl phthalate 72. benzo(a)anthracene (1,2benzanthracene) 73. benzo(a)pyrene (3,4benzopyrene) 74. 3,4-benzofluoranthene 75. benzo(k)fluoranthene (11,12benzofluoranthene) 76. chrysene 77 acenaphthylene 78. anthracene 79. benzo(ghi)perylene (1,12-benzoperylene) 80. fluorene 81. phenanthrene 82. dibenzo (a,h)anthracene (1,2,5,6dibenzanthracene) 83. ideno (1,2,3,-cd)pyrene (2,3,-ophenylenepyrene) 84. pyrene 85. tetrachloroethylene 87 trichloroethylene 88. vinyl chloride (chloroethylene) 89. aldrin\* 90. dieldrin\* 91. chlordane (technical mixture and metabolites)\* 92. 4.4'-DDT\* 93. 4;4'-DDE (p,p'DDX)\* 94. 4,4'-DDD (p,p'TDE)\* 95. a-endosulfan-Alpha\* 96. b-endosulfan-Beta\* 97 endosulfan sulfate\* 98. endrin\* 99. endrin aldehyde\* 100. heptachlor\* 101. heptachlor epoxide\* 102. a-BHC-Alpha\* 103. b-BHC-Beta\* 104. r-BHC (lindane)-Gamma\* 105. g-BHC-Delta\* 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 (fibrous) 129. 2,3,7,8-tetra chlorodibenzo-pdioxın (TCDD) \*We did not analyze for these pollutants in samples of raw wastewater from this subcategory. These pollutants are not

believed to be present based on the

Agency's best engineering judgement which includes consideration of raw materials and process operations. (o) Subpart AA-Primary Rare Earth Metals Subcategory 1. acenaphthene 2. acrolein 3. acrylonitrile 5. benzidene 8. 1.2.4-trichlorobenzene 10. 1,2-dichloroethane 11. 1,1,1-trichloroethane 12. hexachloroethane 13. 1,1-dichloroethane 14. 1,1,2-trichloroethane 15. 1,1,2,2,-tetrachloroethane 16. chloroethane 17 bis(2-chloromethyl)ether (Deleted) 18. bis(2-chloroethyl)ether 19. 2-chloroethyl vinyl ether (mixed) 20. 2-chloronaphthalene 22. para-chloro meta-cresol 24. 2-chlorophenol 25. 1,2-dichlorobenzene 26. 1.3-dichlorobenzene 27 1,4-dichlorobenzene 28. 3,3'-dichlorobenzidene 29. 1,1-dichloroethylene 30. 1,2-trans-dichloroethylene 31. 2,4-dichlorophenol
 32. 1,2-dichloropropane 33. 1,3-dichloropropylene (1,3dichloropropene) 34. 2,4-dimethylphenol 35. 2.4-dinitrotoluene 36. 2,6-dinitrotoluene 37 1,2-diphenylhydrazine 38. ethylbenzene 39. fluoranthene 40. 4-chlorophenyl phenyl ether 41. 4-bromophenyl phenyl ether 42. bis(2-chloroisopropyl)ether 43. bis(2-chloroethoxy)methane 45. methyl chloride (chloromethane) 46. methyl bromide (bromomethane) 50. dichlorodifluorthane (Deleted) 52. hexachlorobutadiene 53. hexachlorocyclopentadiene 54. isophorone 55. naphthalene 56. nitrobenzene 57 2-nitrophenol 58. 4-nitrophenol 59. 2,4-dinitrophenol 60. 4,6-dinitro-o-cresol 61. N-nitrosodimethylamine 62. N-nitrosodiphenylamine 63. N-nitrosodi-n-propylamine 64. pentachlorophenol butyl benzyl phthalate 67 68. di-n-butyl phthalate 69. di-n-octyl phthalate

- 70. diethyl phihalate
- 71. dimethyl phthalate
- 72. benzo(a)anthracene (1,2-
- benzanthracene)
- 73. benzo(a)pyrene (3,4-

benzopyrene) 74. 3,4-benzofluoranthene 75. benzo(k)fluoranthene (11,12benzofluoranthene) 76. chrysene 77 acenaphthylene 78. anthracene 79. benzo(ghi)perylene (1,12benzopervlene) 80. fluorene 81. phenanthrene 82. dibenzo (a,h)anthracene (1,2,5,6dibenzanthracene) 83. ideno (1,2,3,-cd)pyrene (2,3,-ophenylenepyrene) 84. pyrene 85. tetrachloroethylene 87 trichloroethylene 88. vinyl chloride (chloroethylene) 89. aldrin 90. dieldrın 91. chlordane (technical mixture and metabolites) 92. 4,4'-DDT 93. 4,4'-DDE (p,p'DDX) 94. 4,4'-DDD (p,p'TDE) 95. a-endosulfan-alpha 96. b-endosulfan-Beta 97 endosulfan sulfate 98. endrin 99. endrin aldehyde 100. heptachlor 101. heptachlor epoxide 102. a-BHC-Alpha 103. b-BHC-Beta 104. r-BHC (lindane)-Gamma 105. g-BHC-Delta 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 (fibrous) 129. -2,3,7,8-tetra chlorodibenzo-pdioxin (TCDD) (p) Subpart AB--Secondary Tantalum Subcategory 1. acenaphthene\* 2. acrolein\* 3. acrylonitrile\* 4. benzene\* 5. benzıdene\* 6. carbon tetrachloride (tetrachloromethane)\* chlorobenzene\* 7 8. 1,2,4-trichlorobenzene\* 9. hexachlorobenzene\* 10. 1,2-dichloroethane\* 11. 1,1,1-trichloroethane\* 12. hexachloroethane\* 13. 1,1-dichloroethane\* 14. 1,1,2-trichloroethane\*

- 15. 1.1.2.2-tetrachloroethane\*
- 16. chloroethane\*
- 17 bis(2-chloromethyl)ether
- (Deleted)\*

18. bis(2-chloroethyl)ether\* 19. 2-chloroethyl vinyl ether (mixed) 20. 2-chloronaphthalene\* 21. 2,4,6-trichlorophenol\* 22. para-chloro meta-cresol\* 23. chloroform (trichloromethane)\* 24. 2-chlorophenol\* 25. 1,2-dichlorobenzene\* 26. 1,3-dichlorobenzene\* 27 1.4-dichlorobenzene\* 28. 3,3'-dichlorobenzidene\* 29. 1,1-dichloroethylene 30. 1.2-trans-dichloroethylene\* 31. 2,4-dichlorophenol\* 32. 1,2-dichloropropane\* 33. 1,3-dichloropropylene (1,3dichloropropene) 34. 2,4-dimethylphenol\* 35. 2,4-dinitrotoluene\* 36. 2.6-dinitrotoluene\* 37 1,2-diphenylhydrazine\* 38. ethylbenzene 39. fluoranthene\* 40. 4-chlorophenyl phenyl ether 41. 4-bromophenyl phenyl ether\* 42. bis(2-chloroisopropyl)ether\* 43. bis(2-chloroethoxy)methane\* 44. methylene chloride (dichloromethane)\* 45. methyl chloride (chloromethane)\* 46. methyl bromide (bromomethane)\* 47 bromoform (tribromomethane)\* 48. dichlorobromomethane\* 49. trichlorofluoromethane (Deleted)\* 50. dichlorodifluoromethane (Deleted)\* 51. chlorodibromomethane\* 52. hexachlorobutadiene. 53. hexachlorocyclopentadiene\* 54. isophorone\* 55. naphthalene\* 56. nitrobenzene\* 2-nitrophenol\* 57 58. 4-nitrophenol\* 59. 2,4-dinitrophenol\* 60. 4,6-dinitro-o-cresol\* 61. N-nitrosodimethylamine\* 62. N-nitrosodiphenylamine\* 63. N-nitrosodi-n-propylamine\* 64. pentachlorophenol 65. phenol\* bis(2-ethylhexyl) phthalate\* 66. butyl benyl phthalate\* 67 68. di-n-butyl phthalate 69. di-n-octyl phthalate" 70. diethyl phthalate\* 71. dimethyl phthalate\* 72. benzo(a)anthracene (1,2benzanthracene) 73. benzo(a)pyrene (3,4benzopyrene)\* 74. 3.4-benzofluoranthene\* 75. benzo(k)fluoranthene (11,12benzofluoranthene)\* 76. chrysene\* 77 acenaphthylene\*

78. anthracene\* 79. benzo(ghi)perylene (1,12benzopervlene)\* 80. fluorene\* 81. phenanthrene\* 82. dibenzo (a,h)anthracene (1,2,5,6dibenzanthracene)\* 83. ideno (1,2,3-cd)pyrene (2,3,-ophenylenepyrene)\* 84. pyrene\* 85. tetrachloroethylene\* 86. toluene\* 87 trichloroethvlene\* 88. vinyl chloride (chloroethylene)\* 89. aldrin\* 90. dieldrin\* 91. chlordane (technical mixture and metabolites)\* 92. 4.4'-DDT 93. 4,4'-DDE (p,p'DDX)\* 94. 4.4'-DDD (p,p'TDE)\* 95. a-endosulfan-Alpha\* 96. b-endosulfan-Beta\* 97 endosulfan sulfate\* 98. endrin\* 99. endrin aldehyde\* 100. heptachlor\* 101. heptachlor epoxide\* 102. a-BHC-Alpha\* 103. b-BHC-Beta\* 104. r-BHC (lindane)-Gamma\* 105. g-BHC-Delta\* 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 (fibrous) 121. cyanide (total)\* 129. 2,3,7,8-tetra chlorodibenzo-pdioxin (TCDD) • We did not analyze for these pollutants in samples of raw wastewater from this subcategory. These pollutants? are not believed to be present based on the Agency's best engineering judgment which includes consideration of raw materials and process operations. (q) Subpart AC—Primary and Secondary Tin Subcategory 1. acenaphthene 2. acrolein 3. acrylonitrile 5. benzidene 6. carbon tetrachloride (tetrachloromethane) 7 chlorobenzene 8. 1.2.4-trichlorobenzene 10. 1.2-dichloroethane 12. hexachloroethane 13. 1,1-dichloroethane 14. 1,1,2-trichloroethane 15. 1,1,2,2-tetrachloroethane

16. chloroethane

17 bis(2-chloromethyl)ether (Deleted) 18. bis(2-chloroethyl)ether 19. 2-chloroethyl vinyl ether (mixed) 20. 2-chloronaphthalene 21. 2,4,6-trichlorophenol 22. para-chloro meta-cresol 24. 2-chlorophenol 25. 1,2-dichlorobenzene 26. 1,3-dichlorobenzene 27 1,4-dichlorobenzene 28. 3,3'-dichlorobenzidene 30. 1,2-trans-dichloroethylene 31. 2,4-dichlorophenol 32. 1,2-dichloropropane 33. 1,3-dichloropropylene (1,3dichloropropene) 35. 2,4-dinitrotoluene 36. 2,6-dinitrotoluene 40. 4-chlorophenyl phenyl ether 41. 4-bromophenyl phenyl ether 42. bis(2-chloroisopropyl)ether
 43. bis(2-chloroethoxy)methane
 45. methyl chloride (chloromethane)
 46. methyl bromide (bromomethane) bromoform (tribromomethane) 47 48. dichlorobromomethane 49. trichlorofluoromethane (Deleted) 50. dichlorodifluoromethane (Deleted) 51. chlorodibromomethane 52. hexachlorobutadiene 53. hexachlorocyclopentadiene 54. isophorone 56. nitorbenzene 60. 4,6-dinitro-o-cresol 61. N-nitrosocimethylamine 63. N-nitrosodi-n-propylamine 64. pentachlorophenol 69. di-n-octyl phthalate 70. diethyl phthalate 71. dimethyl phthalate 72. benzo(a)anthracene (1,2benzanthracene) 73. benzo(a)pyrene (3,4benzopyrene) 74. 3,4-benzofluoranthene 75. benzo(k)fluoranthene (11,12benzofluoranthene) 76. chrysene 77 acenaphthylene 79. benzo(ghi)perylene (1,12benzopervlene)

82. dibenzo (a,h)anthracene (1,2,5,6dibenzanthracene)

- 83. ideno (1,2,3-cd)pyrene (2,3,-ophenylenepyrene)
- 85. tétrachloroethylene
- 89. aldrın
- 90. dieldrın
- 91. chlordane (technical mixture and metabolites)
- 92. 4,4'-DDT
- 93. 4,4'-DDE (p,p'DDX) 94. 4,4'-DDD (p,p'TDE) 95. a-endosulfan-Alpha
- 96. b-endosulfan-Beta
- 97 endosulfan sulfate
- 98. endrın

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99. endrin aldehvde 100. heptachlor 101. heptachlor epoxide 102. a-BHC-Alpha 103. b-BHC-Beta 104. r-BHC (lindane)-Gamma 105. g-BHC-Delta 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 (fibrous) 129. 2,3,7,8-tetra chlorodibenzo-pdioxin (TCDD) (r) Subpart AD—Primary and Secondary Titanium Subcategory 1. acenaphthene 2. acrolein 3. acrylonitrile 5. benzidene 6. carbon tetrachloride (tetrachloromethane) chlorobenzene 7 8. 1,2,4-trichlorobenzene 9. hexachlorobenzene 10. 1,2-dichloroethane 12. hexachloroethane 14. 1,1,2-trichloroethane 15. 1,1,2,2-tetrachloroethane 16. chloroethane 17 bis(2-chloromethyl)ether (Deleted) 18. bis(2-chloroethyl)ether 19. 2-chloroethyl vinyl ether (mixed) 20. 2-chloronaphthalene 22. para-chloro meta-cresol 24. 2-chlorophenol 25. 1,2-dichlorobenzene 26. 1,3-dichlorobenzene 27 1,4-dichlorobenzene 28. 3,3'-dichlorobenzidene 29. 1,1-dichloroethylene 30. 1,2-trans-dichloroethylene 32. 1,2-dichloropropane 33. 1,3-dichloropropylene (1,3dichloropropene) 34. 2,4-dimethylphenol 35. 2,4-dinitrotoluene37 1,2-diphenylhydrazine 38. ethylbenzene 39. fluoranthene 40. 4-chlorophenyl phenyl ether
41. 4-bromophenyl phenyl ether
42. bis(2-chloroisopropyl)ether 43. bis(2-chloroethoxy)methane 45. methyl chloride (chloromethane)46. methyl bromide (bromomethane) bromoform (tribromomethane) 47 49. trichlorofluoromethane (Deleted)

- 50. dichlorodifluoromethane (Deleted)
- 52. hexachlorobutadiene
- 53. hexachlorocyclopentadiene
- 54. isophorone
- 55. naphthalene

56 nitrobenzene 58. 4-nitrophenol 59. 2,4-dinitrophenol 60. 4,6-dinitro-o-cresol 61. N-nitrosodimethylamine 62. N-nitrosodiphenylamine 63. N-nitrosodi-n-propylamine 72. benzo(a)anthracene (1,2benzanthracene) 73. benzo(a)pyrene (3,4benzopyrene) 74. 3,4-benzofluoranthene 76. chrysene 77 acenaphthylene 78. anthracene 79. benzo(ghi)perylene (1,12benzoperylene) 80. fluorene 81. phenanthrene 82. dibenzo (a,h)anthracene (1,2,5,6dibenzanthracene) 83. ideno (1,2,3-cd)pyrene (2,3-ophenylenepyrene) 84. pyrene 85. tetrachloroethylene 89. aldrın 90. dieldrın 91. chlordane (technical mixture and metabolites) 92. 4,4'DDT 93. 4,4'DDE (p,p'DDX) 96. b-endosulfan-Beta 97 endosulfan sulfate 98. endrin 99. endrin aldehyde 100. heptachlor 101. heptachlor epoxide 104. r-BHC (lindane)-Gamma 105. g-BHC-Delta 106. PCB-1242 (Arochlor 1242)
108. PCB-1221 (Arochlor 1221)
109. PCB-1232 (Arochlor 1232)
110. PCB-1248 (Arochlor 1248)
110. PCB-1248 (Arochlor 1248) 111. PCB-1260 (Arochlor 1260) 112. PCB-1016 (Arochlor 1016) 113. toxaphene 116. asbestos (fibrous) 129. 2,3,7,8-tetra chlorodibenzo-pdioxin (TCDD) (s) Subpart AE-Secondary Tungsten and Cobalt Subcategory 1. acenaphthene\* 2. acrolein\* 3. acrylonitrile\* 4. benzene\* 5. benzidene\* 6. carbon tetrachloride (tetrachloromethane)\* 7 chlorobenzene\* 8. 1,2,4-trichlorobenzene\* 9. hexaschlorobenzene\* 10. 1.2-dichloroethane\* 11. 1,1,1-trichloroethane\* 12. hexachloroethane\* 13. 1,1-dichloroethane\*

- 14. 1,1,2-trichloroethane\*
- 15. 1,1,2,2-tetrachloroethane\*
- 16. chloroethane\*

- 17 bis(2-chloromethyl)ether (Deleted)\* bis(2-chloroethyl)ether\*
   2-chloroethyl vinyl ether (mixed)\* 20. 2-chloronaphthalene\* 21. 2,4,6-trichlorophenol\* 22. para-chloro meta-cresol\* 23. chloroform (trichloromethane)\* 24. 2-chlorophenol\* 25. 1,2-dichlorobenzene\* 26. 1,3'-dichlorobenzene\*27 1,4-dichlorobenzene\* 28. 3,3'-dichlorobenzidene\* 29. 1,1-dichloroethylene\* 30. 1,2-trans-dichloroethylene\* 31. 2,4-dichlorophenol\* 32. 1,2-dichloropropane\* 33. 1.3-dichloropropylene (1,3dichloropropene)\* 34. 2,4-dimethylphenol\* 35. 2,4-dinitrotoluene\* 36. 2,6-dinitrotoluene\* 37 1,2-diphenylhydrazıne\* 38. ethylbenzene\* 39. fluoranthene\* 40. 4-chlorophenyl phenyl ether\* 41. 4-bromophenyl phenyl ether\* 42. bis(2-chloroisopropyl)ether\* 43. bis(2-chloroethoxy)methane\* 44. methylene chloride (dichloromethane)\* 45. methyl chloride (chloromethane)\* 46. methyl bromide (bromomethane)\* 47 bromoform (tribromomethane)\* 48. dichlorobromomethane\* 49. trichlorofluoromethane (Deleted)\* 50. dichlorodifluoromethane (Deleted)\* 51. chlorodibromomethane\* 52. hexachlorobutadiene\* 53. hexachlorocyclopentadiene\* 54. isophorone\* 55. naphthalene\* 56. nitrobenzene\* 57 2-nitrophenol\* 58. 4-nitrophenol\* 59. 2,4-dinitrophenol\* 60. 4,6-dinitro-o-cresol\* 61. N-nitrosodimethylamine\* 62. N-nitrosodimethylamine\* 63. N-nitrosodi-n-propylamine\* 64. pentachlorophenol\* 65. phenol\* bis(2-ethylhexyl) phthalate\* 66. butyl benzyl phthalate\* 67 68. di-n-butyl phthalate\* 69. di-n-octyl phthalate\* 70. diethyl phthalate\* 71. dimethyl phthalate\* 72. benzo(a)anthracene (1,2benzanthracene}\*
- 73. benzo(a)pyrene (3,4-
- benzopyrene)\*
- 74. 3,4-benzofluoranthene\* 75. benzo(k)fluoranthene (11,12-
- benzofluoranthene)\*

76. chrysene\* 77 acenaphthylene\* 78. anthracene\* 79. benzo(ghi)perylene (1,12benzopervlene)\* 80. fluorene\* 81. phenanthrene\* 82. dibenzo (a,h)anthracene (1,2,5,6dibenzanthracene)\* 83. ideno (1.2,3-cd)pyrene (2,3.-ophenylenepyrene)\* 84. pyrene\* 85. tetrachloroethylene\* 86. toluene\* 87 trichloroethylene\* 88. vinyl chloride (chloroethylene)\* 89. aldrin 90. dieldrin\* 91. chlordane (technical mixture and metabolites) 92. 4,4'-DDT 93. 4,4'-DDE (p,p'DDX)\* 94. 4,4'-DDD (p.p'TDE) 95. a-endosulfan-Alpha\* 96. b-endosulfan-Beta\* endosulfan sulfate\* 97 98. endrin\* 99. endrin aldehyde\* 100. heptachlor\* 101. heptachlor epoxide" 102. a-BHC-Alpha 103. b-BHC-Beta\* 104. r-BHC (lindane)-Gamma\* 105. g-BHC-Delta\* 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 (fibrous) 129. 2,3,7,8-tetra chlorodibenzo-pdixoxin (TCDD) \*We did not analyze for these pollutants in samples of raw wastewater from this subcategory. These pollutants are not believed to be present based on the Agency's best engineering judgement which includes consideration of raw materials and process operations. (t) Subpart AF-Secondary Uranium Subcategory 1. acenaphthene\* 2. acrolein\* 3. acrylonitrile\* 4. benzene\* 5. benzidene\* 6. carbon tetrachloride (tetrachloromethane)\* chlorobenzene\* 1,2,4-trichlorobenzene\* 8. 9. hexachlorobenzene\* 10. 1.2-dichloroethane\* 11. 1,1,1-trichloroethane\* 12. hexachloroethane\* 13. 1,1-dichloroethane\*

14. 1.1.2-trichloroethane\* 15. 1,1,2,2-tetrachloroethane\* 16. chloroethane\* 17 bis(2-chloromethyl)ether (Deleted)\* 18. bis(2-chloroethyl)ether\* 19. 2-chloroethyl vinyl ether (mixed)\* 20. 2-chloronaphtalene\* 21. 2.4.6-trichlorophenol\* 22. para-chloro metha-cresol\* 23. chloroform (trichloromethane)\* 24. 2-chlorophenol\* 25. 1,2-dichlorobenzene\* 26. 1,3-dichlorobenzene\* 27. 1,4-dichlorobenzene\* 28. 3,3'-dichlorobenzidene\* 29. 1,1-dichloroethylene\* 30. 1,2-trans-dichloroethylene\* 31. 2,4-dichlorophenol\* 32. 1.2-dichloropropane\* 33. 1,3-dichloropropylene (1,3dichloropropene)\* 34. 2,4-dimethylphenol\* 35. 2.4-dinitrotoluene\* 36. 2,6-dinitortoluene\* 37. 1,2-diphenylhydrazine\* 38. ethylebenzene\* 39. fluoranthene\* 40. 4-chlorophenyl phenyl ether\* 41. 4-bromophenyl phenyl ether\* 42. bis[2-chloroisopropyl]ether\* 43. bis[2-chloroethoxy]methane\* 44. methylene chloride (dichloromethane)\* 45. methyl chloride (chloromethane)\*46. methyl bromide (bromomethane)\* 47 bromoform (tribromomethane)\* 48. dichlorobromomethane\* 49. trichlorofluoromethane (Deleted)\* 50. dichlorodifluoromethane (Deleted)\* 51. chlorodibromomethane\* 52. hexachlorobutadiene\* 53. hexachlorocyclopentadiene\* 54. isophorone\* 55. naphthalene\* 56. nitrobenzene\* 57. 2-nitrophenol\* 58. 4-nitrophenol\* 59. 2.4-dinitrophenol\* 60. 4,6-dinitro-o-cresol\* 61. N-nitrosodimethylamine\* 62. N-nitrosodiphenylamine\* 63. N-nitrosodi-n-propylamine\* 64. petachlorophenol\* 65. phenol\* 66. bis(2-ethylhexyl)phthalate\*
67. butyl benzyl phthalate\*
68. di-n-butyl phthalate\* 69. di-n-octyl phthalate\* 70. diethyl phthalate\* 71. dimethvl phthalate\* 72. benzo(a)anthracene (1,2benzanthracene]\*

73. benzo(a)pyrene (3,4-

benzopyrene)\* 74. 3.4-benzofluoranthene\* 75. benzo(k)fluoranthene (11.12benzofluoranthene)\* 76. chrvsene\* 77 acenaphthylene\* 78. anthracene\* 79. benzo(ghi)perylene (1,12benzoperylene) 80. fluorene\* 81. phenanthrene\* 82. dibenzo (a,h) anthracene (1,2,5,6dibenzanthracene)\* 83. ideno (1,2,3-cd)pyrene (2,3,-ophenylenepyrene)\* 84. pyrene\* 85. tetrachloroethylene\* 86. toluene\* 87 trichloroethylene\* 88. vinyl chloride (chloroethylene)\* 89. aldrin\* 90. dieldrin\* 91. chlordane (technical mixture and metabolites)\* 92. 4,4'-DDT\* 93. 4,4'-DDE (p,p'DDX)\* 94. 4,4'-DDD (p,p'TDE)\* 95. a-endosulfan-Alpha\* 96. b-endosulfan-Beta\* 97 endosulfan sulfate\* 98. endrin\* 99. endrin aldehyde\* 100. heptachlor\* 101. heptachlor epoxide\* 102. a-BHC-Alpha\* 103. b-BHC-Beta\* 103. D-BHC-Delta 104. r-BHC (lindane)-Gamma\* 105. g-BHC-Delta\* 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 (fibrous) 121. cyanide (total)\* 129. 2,3,7,8-tetra chlorodibenzo-pdioxin (TCDD) \*We did not analyze for these pollutants in samples of raw wastewater from this subcategory. These pollutants are not believed to be present based on the Agency's best engineering judgement which includes consideration of raw materials and process operations. (u) Subpart AG---Primary Zirconium and Hafnium Subcategory 1. acenaphthene 2. acrolein 3. acrylonitrile 4. benzene 5. benzıdene 6. carbon tetrachloride (tetrachloromethane)

7 chlorobenzene

8. 1,2,4-trichlorobenzene

9. hexachlorobenzene 10. 1,2-dichloroethane 11. 1,1,1-trichloroethane 12. hexachloroethane 13. 1,1-dichloroethane 14. 1.1.2-trichloroethane 15. 1,1,2,2-tetrachloroethane 16. chloroethane 17 bis(2-chloromethyl)ether (Deleted) 18. bis(2-chloroethyl)ether 19. 2-chloroethyl vinyl ether (mixed) 20. 2-chloronaphthalene 21. 2,4,6-trichlorophenol 22. para-chloro meta-cresol 24. 2-chlorophenol 25. 1,2-dichlorobenzene 26. 1,3-dichlorobenzene 27 1,4-dichlorobenzene 28. 3,3'-dichlorobenzidene 29. 1,1-dichloroethylene 30. 1,2-trans-dichloroethylene 31. 2,4-dichlorophenol 32. 1,2-dichloropropane 33. 1,3-dichloropropylene (1,3dichloropropene) 34. 2,4-dimethylphenol 35. 2,4-dinitrotoluene 36. 2.6-dinitrotoluene 37 1,2-diphenylhydrazine 38. ethylbenzene 39. fluoranthene 40. 4-chlorophenyl phenyl ether 41. 4-bromophenyl phenyl ether 42. bis(2-chloroisopropyl)ether 43. bis(2-chloroethoxy)methane 45. methyl chloride (chloromethane) 46. methyl bromide (bromomethane) 47 bromoform (tribromomethane) 49. trichlorofluoromethane (Deleted) 50. dichlorodifluoromethane (Deleted) 52. hexachlorobutadiene 53. hexachlorocyclopentadiene 54. isophorone 56. nitrobenzene 57 2-nitrophenol 58. 4-nitrophenol 59. 2,4-dinitrophenol 60. 4,6-dinitro-o-cresol 61. N-nitrosodimethylamine 62. N-nitrosodiphenylamine .63. N-nitrosodi-n-propylamine 64. pentachlorophenol 65. phenol 71. dimethyl phthalate 72. benzo(a)anthracene(1,2benzanthracene) 73. benzo(a)pyrene (3,4-benzopyrene) 74. 3,4-benzofluoranthene 75. benzo(k)fluoranthene (11,12benzofluoranthene) 76. chrysene 77 acenaphthylene 78. anthracene 79. benzo(ghi)perylene (1,12benzoperylene) 80. fluorene 81. phenanthrene

82. dibenzo (a,h)anthracene (1,2,5,6dibenzanthracene) 83. ideno (1,2,3-cd)pyrene (2,3,-ophenylenepyrene) 84. pyrene 85. tetrachloroethylene, 86. toluene. 87 trichloroethylene 88. vinyl chloride (chloroethylene) 89. aldrın 90. diedrın 91. chlordane technical mixture and metabolites) 92. 4,4'-DDT 93. 4,4'-DDE (p,p'DDX) 94. 4,4'-DDD (p,p'TDE) 95. a-endosulfan-Alpha 96. b-endosulfan-Beta 97 endosulfan sulfate 98. endrin 99. endrin aldehyde 100. heptachlor 101. heptachlor epoxide 102. a-BHC–Alpha 103. b-BHC–Beta 104. r-BHC (lindane)-Gamma 105. g-BHC-Delta 106. PCB-1242 (Arochlor 1242) 107, PCB-1222 (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 (fibrous) 129. 2,3,7,8-tetra chlorodibenzo-pdioxin (TCDD) Appendix D-Toxic Pollutants Detected Below the Analytical Quantification Limit (a) Subpart A—Bauxite Refining Subcategory 1. acenaphthene 6. carbon tetrachloride (tetrachloromethane) 34. 2,4-dimethylphenol . 39. fluoranthene 48. dichlorobromomethane 64. pentachlorophenol 67 butly benzyl phthalate 80. fluorene 84. Pyrene 86. toluene 91. chlordane (technical mixture and metabolites) 92. 4,4'-DDT 93. 4,4'-DDE (p,p'DDX) 95. a-endosulfan-Alpha 96. b-endosulfan-Beta 97 endosulfan sulfate 98. endrin 99. endrin aldehyde 100. heptachlor 101. heptachlor epoxide 102. a-BHC-Alpha

103. b-BHC-Beta

104. r-BHC (lindane)-Gamma 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) 114. antimony 121. cyanide (total) 125. selenium 126. silver (b) Subpart O-Primary Beryllium Subcategory 114. antimony 121. cyanıde 125. selenium 127 thallium (c) Subpart P-Primary Boron Subcategory 51. dichlorodibromomethane 55. naphthalene 66. bis(2-ethylhexyl)phthalate 68. di-n-butyl phthalate 69. di-n-octyl phthalate 70. diethyl phthalate 114. antimony 117 beryllium 123. mercury 126. silver (d) Subpart Q—Primary Cesium and Rubidium Subcategory 121. cvanide (total) (e) Subpart R-Primary and Secondary Germanium and Gallium Subcategory 21. 2,4,6-trichlorophenol 23. chloroform 64. pentachlorophenol 66. bis(2-ethylhexyl)phthalate 68. di-n-butyl phthalate 87 trichloroethylene 123. mercury (f) Subpart S-Secondary Indium Subcategory 68. di-n-butyl phthalate 70. diethyl phthalate 71. dimethyl phthalate 103. beta-BHC 114. antimony 115. arsenic 123. mercury (g) Subpart T-Secondary Mercury Subcategory 114. antimony 117. beryllium 119. chromium (total) 120. copper 124. nickel 125. selenium 126. silver (h) Subpart U-Primary Molybdenum and Rhenium Subcategory 44. methylene chloride

- 104. gamma-BHC
- 114. antimony
- 127 thallium
- (i) Subpart V—Secondary Molybdenum and Vanadium Subcategory

123. mercury (j) Subpart W-Primary Nickel and **Cobalt Subcategory** 4. benzene 86. toluene 114. antimony 115. arsenic 117 beryllium 119. chromium 122. lead 126. silver 127 thallium (k) Subpart X—Secondary Nickel Subcategory 114. antimony 117 beryllium 118. cadmum 121. cvanide 122. lead 123. mercury 125. selenium 126. silver 127 thallium (I) Subpart Y-Primary Precious Metals and Mercury Subcategory 65. phenol 66. bis(2-ethylhexyl)phthalate 68. di-n-butyl phthalate 78. anthracene 81. phenanthrene 114. antimony (m) Subpart Z-Secondary Precious Metals Subcategory 4. benzene 7 chlorobenzene 10. 1.2-dichloroethane 21. 2,4,6-trichlorophenol 24. 2-chlorophenyl 34. 2,4-dimethylphenol 44. methylene chloride (dichloromethane) 47 bromoform (tribromomethane) 48. dichlorobromomethane 51. chlorodibromomethane 54. isophorone 62. N-nitrosodiphenylamine 68. di-n-butyl phthalate 69. di-n-octyl phthalate 70. diethyl phthalate 71. dimethyl phthalate 86. toluene (n) Subpart AA-Primary Rare Earth Metals Subcategory 7 chlorobenzene 21. 2,4,6-trichlorophenol 47 bromoform (tribromomethane) 65. phenol 86. toluene 114. antimony 117 beryllium (o) Subpart AB-Secondary Tantalum Subcategory 117 beryllium

- 118. cadmium
- 119. chromium
- 125. selenium
- 127 thallium
- (p) Subpart AC-Primary and
- Secondary Tin Subcategory
- 37 1,2-diphenylhydrazine 39. fluoranthene 55. naphthalene 62. n-nitrosodimethylamine 68. di-n-butyl phthalate 78. Anthracene 80. fluorene 81. phenanthrene 87. trichloroethylene (q) Subpart AD-Primary and Secondary Titanium Subcategory 13. 1,1-dichloroethane 21. 2,4,6-trichlorophenol 23. chloroform (trichloromethane) 31. 2.4-dichlorophenol 36. 2.6-dinitrotoluene 48. dichlorobromomethane 51. chlorodibromomethame 57. 2-nitrophenol 70. diethyl phthalate 71. dimethyl phthalate 75. benzo(k)fluoranthene (11,12benzofluoranthene) 88. vinyl chloride (chloroethylene) 107. PCB-1254 (Arochlor 1254) 117 beryllium (r) Subpart AF-Secondary Uranium Subcategory 114. antimony 123. mercury 126. silver 127. thallium (s) Subpart AG-Primary Zirconium and Hafnium Subcategory 55. naphthalene 66. bis)2-ethylhexyl)phthalate 68. di-n-butyl phthalate 69. di-n-octyl phthalate 70. diethyl phthalate 114. antimony 126. silver Apendix E-Toxic Pollutants Detected in Amounts too Small To Be Effectively Reduced by Technologies Considered in Preparing This Guideline (a) Subpart A—Bauxite Refining Subcategory 115. arsenic 127. thallium (b) Subpart O—Primary Beryllium Subcategory 115. arsenic 123. mercury (c) Subpart P-Primary Boron Subcategory

9. hexachlorobenzene

11. 1.1,1-trichloroethane

29. 1.1-dichloroethylene

34. 2,4-dimethylphenol

23. chloroform

- 115. arsenic
- 120. copper
- 125. selenium
- (d) Subpart Q—Primary Cesium and Rudibium Subcategory
  - 123. mercury

125. selenium
(e) Subpart R—Primary and Secondary Germanium and Gallium Subcategory
117 beryllium
(f) Subpart S—Secondary Indium Subcategory

- 117 beryllium
- 120. copper
- (g) Subpart T—Secondary Mercury Subcategory
  - 115. arsenic
- 118. cadmium
- (h) Subpart U—Primary Molybdenum and Rhenium Subcategory
  - 117. beryllium
  - 118. cadmium
  - 121. cyanıde
  - 123. mercurv
- (i) Subpart V—Secondary Molybdenum and Vanadium Subcategory 120. copper
- (j) Subpart W—Primary Nickel and Cobalt Subcategory
  - 66. bis(2-ethylhexyl)phthalate
  - 118. cadmium
  - 123. mercury
  - 125. selenium
- (k) Subpart Y—Primary Precious Metals and Mercury Subcategory
   117 beryllium
  - 125. selenium
- (l) Subpart Z—Secondary Precious Metals Subcategory
  - 57 2-nitrophenol
- 123. mercury
- (m) Subpart AA—Primary Rare Earth Metals Subcategory
  - 121. cyanıde (total)
  - 123. mercury
- (n) Subpart AB—Secondary Tantalum Subcategory
  - 115. arsenic
  - 123. mercury
- (o) Subpart AC—Primary and Secondary Tin Subcategory
- 117 beryllium
- 123. mercury
- (p) Subpart AD—Primary and Secondary Titanium Subcategory 123. mercury
- (q) Subpart AE—Secondary Tungsten and Cobalt Subcategory
  - 117 beryllium
  - 125. selenium
- (r) Subpart AF—Secondary Uranium Subcategory
  - 117 beryllium
- (s) Subpart AG—Primary Zirconium... and Hafnium Subcategory
  - 115. arsenic
  - 117 beryllium
  - 120. copper.
  - 123. mercury
  - 125. selenium

Appendix F-Toxic Pollutants Detected in the Effluent From Only a Small Number of Sources (a) Subpart A-Bauxite Refining Subcategory 23. chloroform (trichloromethane) 44. methylene chloride 55. naphthalene 60. 2,4-dinitro-o-cresol 66. bis(2-ethylhexyl) phthalate
68. di-n-butyl phthalate
70. diethyl phthatate 71. dimethyl phthalate 77 acenaphthylene 85. tetrachloroethylene(b) Subpart O—Primary Beryllium Subcategory 118. cadmium 122. lead 124. nickel 126. silver 128. zinc (c) Subpart P-Primary Boron Subcategory 23. chloroform 44. methylene chloride 48. dichlorobromomethane 67 butyl benzyl phthalate 121. cyanıde (d) Subpart R-Primary and Secondary Germanium and Gallium Subcategory 4. benzene 9. hexachlorobenzene 44. methylene chloride 121. cyanide (e) Subpart S-Secondary Indium Subcategory 44. methylene chloride 64. pentachlorophenol 65. phenol 121. cyanide (f) Subpart U-Primary Molybdenum and Rhenium Subcategory 126. silver (g) Subpart Y-Primary Precious Metals and Mercury Subcategory 4. benzene 44. methylene chloride 70. diethyl phthalate 86. toluene 121. cyanıde (h) Subpart Z—Secondary Precious Metals Subcategory 6. carbon tetrachloride 11. 1,1,1-trichloroethane 23. chloroform 65. phenol 66. bis (2-ethylhexyl) phthalate 117 beryllium

(i) Subpart AA-Primary Rare Earth

23. chloroform (trichloromethane)

Metals Subcategory

6. carbon tetrachloride

(tetrachloromethane)

48. dichlorobromomethane

44. methylene chloride

(dichloromethane)

Tin Subcategory 4. benzene 38. ethylbenzene 44. methylene chloride 57 2-nitorophenol 58. 4-nítrophenol 59. 2,4-dinitrophenol 65. phenol 66. bis (2-ethylhexyl) phthalate 67 butyl benzyl phthalate 84. pyrene 86. toluene 88. vinyl chloride (k) Subpart AD-Primary and Secondary Titanium Subcategory 4. benzene 11. 1,1,1-trichloroethane 44. methylene chloride 64. pentachlorophenol 65. phenol 66. bis (2-ethylhexyl) phthalate67 butyl benzyl phthalate 68. di-n-butyl phthalate 69. di-n-octyl phthalate 86. totuene 87 trichoroethylene 94. 4,4'-DDD(p,p' TDE) 95. a-endosulfan-alpha 102. a-BHC-alpha 103. b-BHC-beta 115. arsenic 121. cyanide 125. selenium 126. silver (l) Subpart AE-Secondary Tungsten and Cobalt Subcategory 114. antimonv 121. cyanıde 123. mercury 127 thallium (m) Subpart AG—Primary Zirconium and Hafnium Subcategory 23. chloroform (trichloroethane) 44. methylene choloride (dichloromethane) 48. dichlorobromomethane 51. chlorodibromomethane 67. butyl benzyl phthalate Appendix G—Toxic Pollutants Effectively Controlled by Technologies Which Other Effluent Limitations and Guidelines Are Based Upon (a) Subpart N-Primary Antimony Subcategory 118. cadmium 120. copper 128. zinc (b) Subpart P-Primary Boron Subcategory 118. cadmium

49. trichlorofluoromethane (Deleted)

(j) Subpart AC-Primary and Secondary

51. chlorodibromomethane

66. bis (2-ethylhexyl) phthalate

- 119. chromium (total)
- 127" thallium
- 128. zinc

(c) Subpart Q—Primary Cesium and
Rubidium Subcategory
114. antimony
115. arsenic
117 beryllium
118. cadmum
119. chromum (total)
120. copper 124. піскеl
124. moter 126. silver
(d) Subpart R—Primary and Secondary
Germanium and Gallium
114. antimony
118. cadmum
119. chromium
120. copper
124. mckel
125. selenium 126. silver
126. sliver 127 thallium
(e) Subpart S—Secondary Indium
Subcategory
119. chromium
124. nickel
125. selenium
126. silver
127 thallium
(f) Subpart T—Secondary Mercury
Subcategory
127 thallium 128. zın <b>c</b>
128. ZINC
(g) Subpart U—Primary Molybdenum and Rhenium Subcategory
119. chromium (total)
120. copper
128. zinc
(h) Subpart V-Secondary Molybdenum
and Vanadium Subcategory
115. arsenic
117 beryllium
118. cadmium
119. chromum
128. zinc
(i) Subpart W—Primary Nickel and
Cobalt Subcategory
128. zınc (j) Subpart X—Secondary Nickel
Subcategory
115. arsemc
128. zinc
(k) Subpart Y-Primary Precious Metals
and Mercury Subcategory
118. cadmium
119. chromium
120. copper
124. nickel
125. selenium
127 thallium
(l) Subpart Z—Secondary Precious Metals Subcategory
metals Subcategory

- 114. antimony
- 115. arsenic
- 118. cadmium
- 119. chromium
- 122. lead
- 124. nickel
- 125. selenium
- 126. silver
- 127 thallium

- (m) Subpart AA—Primary Rare Earth Metals Subcategory
   4. benzene
   115. arsenic
  - 118. cadmıum
  - 120. copper
  - 125. selenium
  - 126. silver
  - 127 thallium
- 128. zinc
- (n) Subpart AB—Secondary Tantalum Subcategory
   114. antimony
- 126. silver
- (o) Subpart AC—Primary and Secondary Tin Subcategory
  - 115. arsenic
  - 118. cadmium
  - 119. chromium
  - 120. copper
  - 125. selenium
  - 126. silver
  - 127 thallium
  - 128. zinc
- (p) Subpart AD—Primary and
- Secondary Titanium Subcategory
  - 114. antimony
  - 118. cadmium
  - 120. copper
  - 128. zınc
- (q) Subpart AG—Secondary Tungsten and Cobalt Subcategory
  - 115. arsenic
  - 118. cadmium
  - 119. chromium
  - 122. lead
  - 126. silver
  - 128. zinc
- (r) Subpart AF—Secondary Uranium Subcategory
  - 115. arsenic
  - 118. cadmium
  - 122. lead
  - 125. selenium
  - 128. zinc
- (s) Subpart AG—Primary Zirconium and Hafnium Subcategory
  - 118. cadmium 127 thallium
  - 128. zinc.
  - 120. 2110.

For the reasons discussed above, EPA proposes to amend 40 CFR Part 421 as follows:

## PART 421—NONFERROUS METALS MANUFACTURING POINT SOURCE CATEGORY

1. The authority citation for Part 421 is revised to read as follows:

Authority: Secs. 301, 304, (b), (c). (e), and (g), 306 (b) and (c), 307 (b) and (c), 308, and 501, Federal Water Pollution Control Act as amended (the Act); 33 U.S.C. 1251, 1311, 1314 (b), (c), (e), and (g), 1316 (b) and (c), 1317 (b) and (c), and 1361; £6 Stat. 816, Pub. L 92-500; 91 Stat. 1567, Pub. L 95-217. § 421.1-421.5 [Redesignated]

2. Sections 421.1 through 421.5 are redesignated as §§ 421.01 through 421.05 respectively.

3. Newly redesignated § 421.04 is revised to read as follows:

§ 421.04 Compliance date for PSES.

The PSES compliance date in subparts A through H is March 8, 1987. The PSES compliance date for plants regulated under subpart I promulgated March 8, 1984 is also March 8, 1987 The PSES compliance date for plants proposed for inclusion under subpart I by this rulemaking is posed to be three years after the date of promulgation. The PSES compliance date for plants in subpart J through subpart AG is proposed to be three years after the date of promulgation.

4. The undesignated paragraph of § 421.12 is revised to read as follows:

§ 421.12 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available.

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

5. Section 421.13 is amended by adding an undesignated paragraph preceding paragraph (a) to read as follows:

§ 421.13 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable.

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

Note.—The Agency is considering establishing a concentration limitation for 2chlorophenol, phenol, and phenols (4-AAP) at a level of 0.010 mg/1. See full discussion in section XI of the preamble to this regulation.

6. Section 421.16 is revised to read as follows:

§ 421.16 Pretreatment standards for new sources.

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

## Subpart I-Metallurgical Acid Plants Subcategory

## § 421.90 [Amended]

7 Section 421.90 is amended by removing the word "and" following "primary zinc facilities" and by inserting the phrase ", and primary molybdenum facilities," before the word "including."

8. Section 421.92 is revised to make technical changes required in converting kg/kkg units to mg/kg units. Also, the text of § 421.91 and §§ 421.93-421.96, which are not proposed to be amended. is set out for the convenience of the commentor. Comments are requested on how these sections apply to primary molybdenum and rhemum facilities.

#### § 421.91 Specialized definitions.

(a) Except as provided below, the general definitions, abbreviations, and methods of analysis set forth in 40 CFR Part 401 apply to this subpart.

(b) The term "product" means 100 percent equivalent sulfuric acid, H2SO4 capacity.

§ 421.92 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available.

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

### BPT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average	
	mg/kg (pounds per milli pounds) of 100 perce sulfunc acid capacity		
	summe acto	i capacity	
Cadm:um	G_180	· · ·	
	· · · · · · · · · · · · · · · · · · ·	0.030	
Copper	Ø.180	0.030	
Copper Lead Zinc	0.180 5.000	0.030	
Cadmum Copper Lead Znc Total suspended solids	0.180 5.000 1.800	0.030 2.000 0.790	

<sup>1</sup> Within the range of 6.0 to 9.0 at all times.

§ 421.93 Effluent limitations guidelines representing the degree of effiuent reduction attainable by the application of the best available technology economically achievable.

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

#### Subpart I—Metallurgical Acid Plant

BAT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
		ds per million i 100 percent d capacity

.....

AISCING	3.550	1,456
Cadm:um	.511	.204
Copper	3.269	1.558
Lead	.715	.332
Zinc	2.605	1.073
	2.000	1.073

§ 421.94 Standards of performance for new sources.

Any new source subject to this subpart shall achieve the following new source performance standards:

#### Subpart I—Metallurgical Acid Plant

NSPS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	pounds) o	ds per million f 100 percen

sultune acid capacity	
3.550	1.456
3.269	.204 1.558
.715	.332 1.073
38.310	30.650 ( <sup>1</sup> )
	3.550 .511 3.269 .715 2.605

<sup>1</sup> Within the range of 7.5 to 10.0 at all times.

#### § 421.95 Pretreatment standards for existing sources.

Except as provided in 40 CFR 403.7 and 403.13, any existing source subject to this subpart which introduces pollutants into a publicly owned treatment works must comply with 40 CFR Part 403 and achieve the following pretreatment standards for existing sources. The mass of wastewater pollutants in metallurgical acid plant blowdown introduced into a POTW shall not exceed the following values:

#### Subpart I-Metallurgical Acid Plant

PSES

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (poun pounds) of	ds per million

Cadmum	.511 2.605	.204 1.073
		<u> </u>

§ 421.96 Pretreatment standards for new sources.

Except as provided in 40 CFR 403.7. any new source subject to this subpart which introduces pollutants into a

publicly owned treatment works must comply with 40 CFR Part 403 and achieve the following pretreatment standards for new sources. The mass of wastewater pollutants in metallurgical acid plant blowdown introduced into a POTW shall not exceed the following values:

# Subpart I-Metallurgical Acid Plant

## PSNS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average	
	mg/kg (pounds per mi pounds) of 100 pon sulfunc acid capacity		
Arsonic Cadmum Copper Lead Zinc	3.550 .511 3.269 .715 2.605	t 450 .204 1.550 .332 1.073	

9. Subparts N through AG are added to read as follows:

Subpart N-Primary Antimony Subcatogory Sec.

- 421.140 Applicability: Description of the primary antimony subcategory.
- 421.141 Specialized definitions. 421.142 Effluent limitations guidelines
- representing the degree of effluent reduction attainable by the application of the best practicable control technology
- currently available. 421.143 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable.
- 421.144 Standards of performance for new sources.
- 421.145 [Reserved]
- 421.146 Pretreatment standards for new sources.
- 421.147 [Reserved]
- Subpart O-Primary Beryilium Subcategory
- 421.150 Applicability: Description of the primary beryllium subcategory.
- 421.151 Specialized definitions. 421.152 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best practicable control technology
- currently available. 421.153 Effluent limitations guidelines repesenting the degree of effluent reduction attainable by the application of the best available technology economically achievable.
- 421.154 Standards of performance for new sources.
- 421.155 [Reserved] 421.156 Pretreatment standards for new sources.
- 421.157 [Reserved]
- Subpart P—Primary Boron Subcategory
- 421.160 Applicability: Description of the

primary boron subcategory.

421.161 Specialized definitions.

- 421.162-421.163 [Reserved]
- 421.164 Standards of performance for new sources.
- 421.165 [Reserved]
- 421.166 Pretreatment standards for new

sources. 421.167 [Reserved]

- Subpart Q-Primary Cesium and Rubidium Subcategory
- 421.170 Applicability: Description of the primary cesium and rubidium subcategory.
- 421.171 Specialized definitions.
- 421.172-421.173 [Reserved]
- 421.174 Standards of performance for new sources.
- 421.175 [Reserved]
- 421.176 Pretreatment standards for new sources.
- 421.177 [Reserved]

#### Subpart R-Primary and Secondary Germanium and Gallium Subcategory

- 421.180 Applicability: Description of the primary and secondary germanium and gallium subcategory.
- 421.181 Specialized definitions.
- 421.182 Effluent limitations guidelines representing the degree of effluent reduction attamable by the application of the best practicable control technology currently available.
- 421.183 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable.
- 421.184 Standards of performance for new sources.
- 421.185 Pretreatment standards for existing sources.
- 421.186 Pretreatment standards for new sources.
- 421.187 [Reserved]
- Subpart S-Secondary Indium Subcategory
- 421.190 Applicability: Description of the secondary indium subcategory.
- 421.191 Specialized definitions.
- 421.192-421.193 [Reserved]
- 421.194 Standards of performance for new sources.
- 421.195 Pretreatment standards for existing SOUTCES.
- 421.196 Pretreatment standards for new sources.
- 421.197 [Reserved]

Subpart T—Secondary Mercury

- Subcategory
- 421.200 Applicability: Description of the secondary mercury subcategory.
- 421.201 Specialized definitions.
- 421.202–421.203 [Reserved] 421.204 Standards of performance for new sources.
- 421.205 [Reserved]
- 421.206 Pretreatment standards for new sources.
- 421.207 [Reserved]
- Subpart U—Primary Molybdenum and Rhenium Subcategory
- 421.210 Applicability: Description of the primary molybdenum and rhenium subcategory.

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- Sec.
- 421.211 Specialized definitions.
- 421.212 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available.
- 421.213 Effluent limitations gardelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable.
- 421.214 Standards of performance for new sources.
- 421.215 [Reserved] . 421.216 Pretreatment standards for new sources.
- 421.217 [Reserved]
- Subpart V—Secondary Molybdenum and Vanadium Subcategory
- 421.220 Applicability: Description of the secondary molybdenum and vanadium subcategory.
- 421.221 Specialized definitions.
- 421.222 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available.
- 421.223 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable.
- 421.224 Standard of performance for new sources.
- 421.225
- [Reserved] Pretreatment standards for new 421.226 sources.
- 421.227 [Reserved]
- Subpart W-Primary Nickei and Cobalt Subcategory
- 421.230 Applicability: Description of the primary nickel and cobalt subcategory.
- 421.231 Specialized definitions.
- 421.232 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available.
- 421.233 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable.
- 421.234 Standards of performance for new sources.
- [Reserved] 421.235
- Pretreatment standards for new 421.236 sources.
- 421.237 [Reserved]
- Subpart X-Secondary Nickel Subcategory
- 421.240 Applicability: Description of the
- secondary nickel subcategory. 421.241 Specilized definitions.
- 421.242-421.243 [Reserved]
- 421.244 Standards of performance for new sources.
- 421.245 Pretreatment standards for existing sources. 421.246 Pretreatment standards for new
- sources.
- 421.247 [Reserved]

Subpart Y-Primary Precious Metals and Mercury Subcategory

26419

- Sec.
- 421.250 Applicability: Description of the primary precious metals and mercury subcategory.
- 421.251 Specialized definitions.
- 421.252 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available.
- 421-253 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable.
- 421.254 Standards of performance for new sources.
- [Reserved] 421.255
- 421.250 Pretreatment standards for new sources.
- 421.257 [Reserved]
- Subpart Z-Secondary Precious Metals Subcategory
- 421.260 Applicability: Description of the secondary precious metals subcategory.
- 421.261 Specialized definitions.
- 421.262 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available.
- 421.263 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable.
- 421.264 Standards of performance for new sources.
- 421.265 Pretreatment standards for existing sources.
- 421.266 Pretreatment standards for new sources.
- 421.267 [Reserved]
- Subpart AA—Primary Rare Earth Metals Subcategory
- 421.270 Applicability: Description of the primary rare earth metals subcategory.

representing the degree of effluent

421.273 Effluent limitations guidelines

the best available technology

economically achievable.

representing the degree of effluent

421.274 Standards of performance for new

421.275 Pretreatment standards for existing

421.276 Pretreatment standards for new

421.280 Applicability: Description of the

secondary tantalum subcategory.

Subpart AB—Secondary Tantalum

421.281 Specialized definitions.

reduction attainable by the application of

reduction attainable by the application of

the best practicable control technology

421.271 Specialized definitions. 421.272 Effluent limitations guidelines

currently available.

sources.

SOURCES

sources

Subcategory

421.277 [Reserved]

Sec.

- 421.282 Effluent limitations guidelines, representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available.
- 421.283 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable
- 421.284 Standards of performance for new sources.
- 421.285 [Reserved]
- 421.286 Pretreatment standards for new sources.
- 421.287 [Reserved]

# Subpart AC—Primary and Secondary Tin Subcategory

- 421.290 Applicability: Description of the primary and secondary tin subcategory.
   421.291 Specialized definitions.
- 421.291 Specialized definitions. 421.292 Effluent limitations guidelines, representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available.
- 421.293 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable
- 421.294 Standards of performance for new sources.
- 421.295 Pretreatment standards for existing sources.
- 421.296 Pretreatment standards for new sources.
- 421.297 [Reserved]

## Subpart AD—Primary and Secondary Titanium Subcategory

- 421.300 Applicability: Description of the primary and secondary titanium subcategory.
- 421.301 Specialized definitions.
- 421.302 Effluent limitations guidelines, representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available.
- 421.303 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable
- 421.304 Standards of performance for new sources.
- 421.305 Pretreatment standards for existing sources.
- 421.306 Pretreatment standards for new sources.

421.307 [Reserved]

# Subpart AE—Secondary Tungsten and Cobalt Subcategory

- 421.310 Applicability: Description of the secondary tungsten and cobalt subcategory.
- 421.311 Specialized definitions.
- 421.312 Effluent limitations guidelines, representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available.
- 421.313 Effluent limitations guidelines representing the degree of effluent

#### Sec.

- reduction attainable by the application of the best available technology economically achievable
- 421.314 Standards of performance for new sources.
- 421.315 [Reserved]
- 421.316 Pretreatment standards for new sources.
- 421.317 [Reserved]

## Subpart AF—Secondary Uranium Subcategory

- 421.320 Applicability: Description of the secondary uranium subcategory.
- 421.321 Specialized definitions.
- 421.322 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available.
- 421.323 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable.
- 421.324 Standards of performance for new sources.
- 421.325 [Reserved]
- 421.326 Pretreatment standards for new sources.
- 421.327 [Reserved]

# Subpart AG—Primary Zirconium and Hafnium Subcategory

- 421.330 Applicability: Description of the primary zirconium and hafnium subcategory.
- 421.331 Specialized definitons.
- 421.332 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available.
- 421.333 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable.
- 421.334 Standards of performance for new sources.
- 421.335 Pretreatment standards for existing sources.
- 421.336 Pretreatment standards for new sources.

421.337 [Reserved]

## Subpart N—Primary Antimony Subcategory

§ 421.140 Applicability: Description of the primary antimony subcategory.

The provisions of this subpart are applicable to discharges resulting from the production of antimony at primary antimoly facilities.

§ 421.141 Specialized definitions.

For the purposes of this subpart the general definitions, abbreviations, and methods of analysis set forth in 40 CFR Part 401 shall apply to this subpart. § 421.142 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available.

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

(a) Sodium Antimonate Autoclave Wastewater.

BPT LIMITATIONS FOR THE PRIMARY ANTIMONY SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	ma/ka (pour	da ner million

manua (hom				
pounds)				
contained	in	codi	um.	an-
timonato p				

Antimony	20.360	9.079
Arsenic	14.830	6,100
Lead	2,979	1.419
Mercury	1.773	0.709
Total suspended solids	290,600	138,300
pH	(9)	(1)

<sup>1</sup> Within the range of 7.5 to 10.0 at all times.

# (b) Fouled Anolyte.

## BPT LIMITATIONS FOR THE PRIMARY ANTIMONY SUBCATEGORY

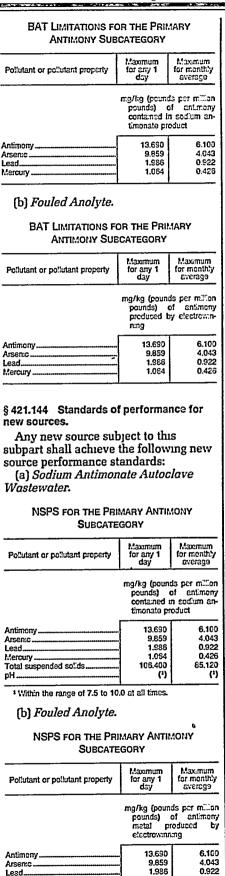
Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly avorage
	mg/kg (pounds per mi pounds) of antim metal produced electrowinning	
Antimony	20.360	9.079
Arsenic	14.830	6,100
Lead	2.979	1.419
Mercury	1.773	0.709
Total suspended solids	290.800	138.300
pH	(י)	(4)

<sup>1</sup> Within the range of 7.5 to 10.0 at all times.

§ 421.143 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable.

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

(a) *Sodium Antimonate Autoclave Wastewater.* 



1.064

106 400

Mercurv

Total suspended solids.

0.428

85.120

NSPS FOR THE PRIMARY ANTIMONY SUBCATEGORY—Continued

Pellutant or pallutant property	Maximum fer cny 1 day	Maximum for monoly evenego
¢X	(!)	(4)
"Within the range of 7.5 to 10	0 at cll t.mca.	

## § 421.145 [Reserved]

§ 421.146 Protreatment standards for now sources.

Except as provided in 40 CFR 403.7, any new source subject to this subpart which introduces pollutants into a publicly owned treatment works must comply with 40 CFR Part 403 and achieve the following pretreatment standards for new sources. The mass of wastewater pollutants in primary antimony process wastewater introduced into a POTW shall not exceed the following values:

(a) Sodium Antimonate Autoclave Wastewater.

## PSNS FOR THE PRIMARY ANTIMONY SUBCATEGORY

Pollutant or pollutant property	Maximum fer city 1 city	Macrum fer maniby sverego	
	mg/kg (poundo por milio poundo) el ಡಿಸಬಿಸರಾ contoned m podúm ಹ timenato produst		
Antmony Arechic Load Moreury	13,000 9,659 1,605 1,604	6 100 4 043 0.922 0.426	

## (b) Fouled Anolyte.

PSNS FOR THE PRIMARY ANTIMONY SUBCATEGORY

Pollutant or pollutant property	Maximum for city 1 day	Maximum for mentily average	
	mg/Vg (prends por millon prends) of antimany motal produced by clostrawanang		
Ant.mony Arsen:e Lead Mercury	13.600 9.859 1.055 1.054	0.103 4 043 0.922 0 426	

## § 421.147 [Reserved]

## Subpart O—Primary Beryllium Subcategory

§ 421.150 Applicability: Description of the primary beryilium subcategory.

The provisions of this subpart are applicable to discharges resulting from the production of beryllium by primary beryllium facilities processing beryllium ore concentrates or beryllium hydroxide raw materials. § 421.151 Specialized definitions.

For the purpose of this subpart the general definitions, abbreviations and methods of analysis set forth in 40 CFR Part 401 shall apply to this subpart.

§ 421.152 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available.

Except as provided m 40 CFR 125.30 through 125.32, any existing point source subject to this subpart shall achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable technology currently available:

(a) Solvent Extration Raffinate-Bertrandite Ore.

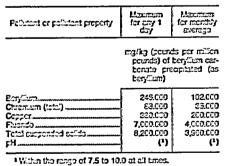
## BPT LIMITATIONS FOR THE PRIMARY BERYLLIUM SUBCATEGORY

Pallutant or pollutant property	Maximum lor any 1 day	Maximum for monthly average
	mg/kg (counds per millen pounds) of beryillum cer- bonate preoplated (as beryillum)	
Boryfurn	2,762.000 \$63.200 4,267.000 73,600.000 \$2,000.000 (*)	1,145.000 404.300 2,245.000 44,920.000 43,790.000 ( <sup>5</sup> )

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

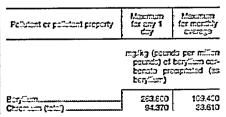
## (b) Solvent Extraction Raffinate-Beryl Ore.

## BPT LIMITATIONS FOR THE PRIMARY BERYLLIUM SUBCATEGORY



# (c) Beryllium Carbonate Filtrate.

#### BPT LIMITATIONS FOR THE PRIMARY BERYLLIUM SUBCATEGORY



# BPT LIMITATIONS FOR THE PRIMARY **BERYLLIUM SUBCATEGORY—Continued**

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
Copper	407.500	214.500
Fluoride	7,507.000	4,290.000
Total suspended solids	8,794.000	4,183.000
pH	(1)	( <sup>1</sup> )

\* Within the range of 7.5 to 10.0 at all times.

# (d) Beryllium Hydroxide Filtrate.

## BPT LIMITATIONS FOR THE PRIMARY BERYLLIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum monthly average	
	mg/kg (pounds per million pounds) of beryflium hy- droxide precipitated (as beryflium)		
Beryllium Chromium (total)	64.780	26.860	
Copper	23.170 100.100	9.479 52.660	
Fluoride	1,843.000	1,053.000	
Total suspended solids	2,159.000	1,027.000	
рН	(1)	(י)	

\* Within the range of 7.5 to 10.0 at all times.

# (e) Beryllium Oxide Calcining Furnace Wet Air Pollution Control.

## BPT LIMITATIONS FOR THE PRIMARY BERYLLIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum monthly average
•	mg/kg (pounds per million pounds) of beryllium oxide produced	
Beryllium Chrom:um (total) Copper Fluoride Total suspended solids pH	324.400 116.100 501.100 9,231.000 10,810.000 ( <sup>1</sup> )	134.500 47.470 263.700 5,275.000 5,143.000 ( <sup>1</sup> )

\* Within the range of 7.5 to 10.0 at all times.

(f) Beryllium Hydroxide Supernatant.

## BPT LIMITATIONS FOR THE PRIMARY BERYLLIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum monthiy average	
	mg/kg (pounds per million pounds) of beryllium hy- droxide produced (as beryllium)		
Beryllium Chromium (total) Copper Fluoride Total cuspended solids	128.300 45.900 198.200 3,652.000 4,277.000 (1)	53.210 18.780 104.300 2,087.000 2,035.000	

Within the range of 7.5 to 10.0 at all times.

(g) Process Condensates.

ł	BPT LIMITATIONS F		4451
I	_		
	BERYLLIUM SU	BCATEGORY	r
ŀ			1
ľ	Pollutant or pollutant property	Maximum for any 1	Maximum monthly
		day	average
			·
		mg/kg (pour	ds per million
	,		of beryllium
		pebbles pr	oduced
	D		<u></u>
	Beryllium	0.000	0.000
	Chromum (total)	. 0.000	0.000
	Copper Fluoride	. 0.000	0.000
	Total suspended solids		0.000
	pH	( <sup>1</sup> )	0.000
			(*)
	<sup>1</sup> Within the range of 7.5 to 10	.0 at all times.	
	•		
	(h) <i>Fluorıde Furnac</i>	e Scruhbe	r.
	(, = = = = = = = = = = = = = = = = = =		
	BDT LIMITATIONS OF		
	BPT LIMITATIONS FO		
	BERYLLIUM SU	BCATEGORY	
		Maximum	Maximum
	Pollutant or pollutant property	for any 1 day	for monthly average
			average
			ds per million of beryllium
		pebbles pro	
	Beryllium.		1.125
	Chrom:um (total)		0.397
	Copper	4.190	2.205
	Fluoride	77.180	44.100
	Total suspended solids	90.410	43.000
	рн	(1)	(1)
	<sup>1</sup> Within the range of 7.5 to 10.	0 at all times	
	(i) Chıp Leachıng.		
	(.)		
	BDT LIMITATIONS FO		
	BPT LIMITATIONS FO		IARY
	BERYLLIUM SUE	SCATEGORY	
	Pollutant or pollutant property	Maximum	Maximum
	i ondram or pondram property	for any 1 day	monthly average
		- vay	average
		malka (noved	
		mg/kg (pound pounds) o	f beryllium
		metal leache	
	r		
	Beryllium	5.833	2.419
	Chrom:um (total)	2.087	0.854
	Copper	9.010	4.742
i	Fluoride	166.000	94.840
	Total cusa and a dida		

<sup>1</sup> Within the range of 7.5 to 10.0 at all times.

Total suspended solids.

ρН..

§ 421.153 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable.

194.400

(<sup>1</sup>)

92.470

(1)

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

# (a) Solvent Extraction Raffinate-Bertrandite Ore.

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BAT LIMITATIONS FOR THE PRIMARY BERYLLIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum monthly average
	mg/kg (pound pounds) of	is per million beryllium car-

	bonato precipitated (as beryllium)			
Bəryilium Chromium (total) Copper Fluondə	831.000	763.600 336.900 1,370.000 44,920.000		

## (b) Solvent Extraction Raffinate-Beryl )re.

## BAT LIMITATIONS FOR THE PRIMARY BERYLLIUM SUBCATEGORY

Pollutant or pollutant property	Maximum Maximu for any 1 month day average		
-	mg/kg (poundo per million pounds) of beryllium car- bonate precipitated (as beryllium)		
Beryllium Chromum (total) Copper Fluorido	164.000 74.000 256.000 7,000.000	68.000 30.000 122.000 4,000.000	

# (c) Beryllium Carbonate Filtrate.

## BAT LIMITATIONS FOR THE PRIMARY BERYLLIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 Pday	Maximum for monthly averago		
	mg/kg (pounds per million pounds) of beryllium car- bonato precipitated (as beryllium)			
Beryllium	175.900	72.930		
Chrom.um (total)	79.360	32.170		
Copper	274.600	130.900		
Fluoride	7,507.000	4,290.000		

# (d) Beryllium Hydroxide Filtrate.

## BAT LIMITATIONS FOR THE PRIMARY BERYLLIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average	
	mg/kg (pounds per million pounds) of beryllium hy- droxido precipitated (as beryllium)		
	droxido pre		
Beryllium	droxido pre berytlium) 43,180		
Chrom.um (total)	droxido pre beryllium)	cipitated (as	
Beryllium Chrom.um (total) Copper	droxido pre berytlium) 43,180	cipitated (as 17.910	

e.

(e) Beryllium Oxıde Calcınıng Furnace Wet Aır Pollution Control.		BAT LIMITATIONS FOR THE FRIMARY BERYLLIUM SUBCATEGORY			NSPS FOR THE PROMARY BERYLLIUM Suzcategory-Continued			
BAT LIMITATIONS FO BERYLLIUM SUB		IARY	Pollutant or pollutant property	Noarram far any 1 day	Moxim for monopy evenego	Periodant ex policiant property	Maximum for cny 1 day	Maximum for monthly average
Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average		rrg/8-g (pount poundo) motal locati	ef toyCum	C:ppor Flut: 50 Teled exertention selfes	274.600 7,507.000 3,217.000	130.500 4,250.000 2,574.000
	mg/kg (pound pounds) oxde produ	of bery2.um	Boryl um. Ohrem um (tota')	3 CC3 1 755 6 970	1 612 0 711 2 833	۲۲ میں ۲۶ میں	(*) 1 all times.	(1)
Benyl'ium	21.630	8.267	Flutrdo	109000	C4 E4 D	(d) Beryllium Hydro	oxide Filtr	ate.
Chrom:um (total)	9.758 33.760	3.956 16 030				NEBS coo rue Bou	HOM BOOM	
Fluoride	923.100	527.500	§ 421.154 Standards of new sources.	f performa	nco for	NSPS FOR THE PRIMARY BERYLLIUM SUBCATEGORY		
(f) Beryllium Hydro	xıde Supe	rnatant.	Any new source subject to this Subpart shall achieve the following new		Pellutant or pellutant property	Maximum for any 1 day	Maximum for monthly everage	
BAT LIMITATIONS FO			source performance st (a) <i>Solvent Extracti</i> <i>Bertrandite Ore</i> .		nte-		ng/kg (poun poundo) of droxda pra	is per millen bery'lum hy- copiated (as
Pollutant or pollutant property	Maxmum for any 1 day	Moximum for monthly overage	NSPS FOR THE PRIM	ARY BERY	LIUM		tery/Lum)	T
· · · · · · · · · · · · · · · · · · ·	uay	average	SUBCATE	GORY		ອດຖະມາ ດາະເກມກ (ປະນາ)	43.1EJ 19.430	17.910 7.839
	mg/kg (pount pounds) of	is per millen beryillum hy-		Max marm	Махлит	Copper.	67,410 1,843.000	32,130 1,053.000
		reduced (cs	Pollutant or parlutant property	for any 1 day	ובי הבחשטי פיניניסט	Filteride	032.657	632.000
Bervilium	85.550	25.470		malka (cava	da par milian	FH		
Chromum (totai)	38.E00	15.650		peunis) of		* Within rengo of 7.5 to 199 at	1 El Linca.	
Copper	133.600 3,652.000	63.640 2,037.000		ಕಲ್ಯಾಜಿಚಾ)	فسها فاستنوعنا	(e) Beryllium Oxide	Calcining	3
	<u> </u>		Benglum	1,8420:0	763600	Furnance Wet Air Pol	lution Co	ntrol.
(g) Process Condens	sates.		Chromum (totol)	831 C00 2,875 C10 78 C09 C19	332,600 1,370,000 44,900,000	NSPS FOR THE PRIMARY BERYLLIUM		LEIUM
BAT LIMITATIONS F	-		Total suspended set da	CC2CC2.88	650 638,63 ( <sup>1</sup> )			
BERYLLIUM SU		·····	Within the range of 7.5 to 10	no et ell times	, ,	Pellinant or pollitant property	Maximum for any 1 day	Maximum for monitly average
Pollutant or pollutant property	Maxamum for any 1 day	Maximum for mentity average	(b) Solvent Extracti Ore.	ion Raffin	ate-Beryl		mg/kg (poun pounda)	ds per millon of teryllom
		ds per m.llon of benyllum oduced	NSPS FOR THE PRI		LUUM	8ເກ_ີນຫ ດີສະຫມາ ((ລະລີ)	21.630 9.753	8.957 3.955
Beryilium	0.000	0.000		Maximum	Maxman	Copper	33.760 923.100	16.090 527.550
Chromium (total)	0.000	0.660	Pollutant or pollutant property	fer eny 1 Cay	for manually evenego	Total suspended selids	335.600	316.500
Fluoride	0.000	0.000		1		рН	. (*)	( <sup>1</sup> )
(h) <i>Fluorıde Furnac</i>	e Scrubbe	r.		to (Control 13 Otored	ಮ ೯೦೫ ಕಮ್ಮಾ ಕಿಲ್ರಾಮಿಗಾ ೯೦೫- ಜ್ಯಾಮಿಂತ (ಜ	Within range of 7.5 to 10.0 at all times. (f) Beryllium Hydroxide Supernatant.		
		AADV		tor/227)			-	
BAT LIMITATIONS F BERYLLIUM SU			Bery("um Chromum (tote") Copper Fluendo	164.000 74.000 250.000 7,000.000	80 000 122,000	NSPS FOR THE PRIM SUBCATE		LLIUM
Pollutant or pollutant property	Maximum for any 1 day	Maximum for mentily average	Total suspended ccida	3,019(19 - (')	2,400,000	Peliutant or pellutant property	Maraman for any 1 day	Maximum for monthly average
		ids per million of beryllium	• Within rango of 7.5 to 100 a (c) Beryllium Carbo		ale.	mg/kg (pounds per millio pounds) at benyillum hy		
	· · · ·		NSPS FOR THE PRI	MARY REPY			crocca p beryCum)	neduced (21
Beryllium Chromaum (total)	. 1.808	0.750	SUBCATE			Bayan	85.550	35.470
Copper	2.823 77.160			1		Chroman (tota)	33.600	15.630
Fluoride	- 77.160	44.100	Pollutant or pollutant property	Maximum for cry 1 doy	Macmun far maniby everege	Copper Fhiendo Teini suspended solida	133.600 3,652.000 1,565.000	
(i) Chıp Leachıng.				mailes fee		FH.	()	
				prosection (C	ಭಂ ೯೦೯ ಗಾರ್ಮಿಗ ೧೯೮೫ ರಾಗ್ರಿಯಾ ಕರ್ಡ ೧೯೮೫ ರಂಭ ಬಂಧ	*W.than rango of 7.5 to 12.0 a		
						(g) Process Conden	sates.	
			Ecn/Cum Chromom (toto)	175.900 79.200		l		

....

20424 reue	rai Kegis	ster / vc	<b>1.</b> 49, 100. 1
NSPS FOR THE PRI		LLIUM	(a) Solve Bertrandit
Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average	PSNS F
		ds per million of betyllium oduced	Pollutant or poll
Beryllium Chromium (total) Copper Fluorida Total suspended solids PH Within range of 7.5 to 10.0 a	. 0.000 0.000 0.000 0.000 . ( <sup>1</sup> )	0.000 0.000 0.008 0.000 0.000 (1)	Beryilium Chromium (total) Copper Fluoride
(h) <i>Fluoride Furnac</i> NSPS FOR THE PRIM	MARY BERY		(b) Solver Ore.
Follutant or pollutant property	Maximum for any 1 day	Maximum for monthly average	PSNS F
	mg/kg (poun pounds) pebbles pro	of beryllium	Pollutant or pollu
Beryllium Chromium (total) Copper Fluonde	0.816 2.823	0.750 0.331 1.345 44.100	-
Total suspended solids pHt	33.080 ( <sup>1</sup> )	26.460 (')	Beryllium Chromium (total) Copper Fluoride
(i) Chip Leaching.			(c) <i>Berylli</i>
NSPS FOR THE PRIM SUBCATE			PSNS FO
Pollutant or pollutant property	Maxemum for any 1 day	Maximum for monthly average	Pollutant or pollu
	mg/kg (pound pounds) o metal leache	f beryllium	
Beryllium Chromium (total) Copper Fluoride Total suspended solids	3.889 1.755 6.070 166.000 71.130 ( <sup>1</sup> )	1.612 0.711 2.893 94.840 58.910 ( <sup>1</sup> )	Beryllium Chrom:um (tota) Copper Fluoride
Within the range of 7.5 to 10.0 <b>421.155</b> [Reserved]	) at all times.		(d) <i>Berylli</i>
§ 421.156 Pretreatment sources.	standards	for new	PSNS FO
Except as provided i any new source subjec which introduces pollu publicly owned treatme comply with 40 CFR Pa	t to this su tants into ent works	ibpart a must	Pollutant or pollut
achieve the following p	retreatme	nt	<b>D</b> = - //

standards for new sources. The mass of wastewater pollutants in primary beryllium process wastewater introduced into a POTW shall not exceed the following values:

(a) <i>Solvent Extract</i> Bertrandite Ore.	tion Raffin	ate-
PSNS FOR THE PRI SUBCATE		LLIUM
Pollutant or pollutant property	Maximum for any 1 day	Maxamum for monthly average
	pounds) of	ds per million beryillum car- ecipitated (as
Beryflum Chromium (total) Copper Fluoride	831.000 2,875.000	763.600 336.900 1,370.000 44,920.000
(b) Solvent Extracti Ore.	on Raffind	ate-Beryl
PSNS FOR THE PRIM SUBCATE		LIUM
Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average

mg/kg (pounds per million pounds) of beryllium carbonate precipitated (as beryllium)

> 68.000 30.000

122.000

4,000.000

Maximum for monthly

164.000 74.000

256.000

7,000.000

# (e) Beryllium Oxıde Calcıning Furnace Wet Aır Pollution Control.

PSNS FOR THE PRIMARY BERYLLIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly averago	
	mg/kg (pounds per million pounds) of borytilum oxide produced		
Beryllium	21.630	0.967	
Aromum (total)	9.758	<b>J.950</b>	
Copper	33.760	10.090	
-luondo	923,100	527,500	

# (f) Beryllium Hydroxide Supernatant.

#### PSNS FOR THE PRIMARY BERYLLIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly averago
	ma/ka (poupi	

mg/kg (pounds per million pounds) of boryllium trydroxido produced (as boryllium)

Boryläum Chromium (totai) Copper Fluorido	38.600 133.600	35,470 15,650 63,640 2,087,000
		2,001,000

#### (g) Process Condensates.

#### PSNS FOR THE PRIMARY BERYLLIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for menthly average
	mg/kg (pounds per milli pounds) of berylliu pebbles produced	
Boryllium Chromium (total) Copper	0.000 0.000 0.000	0.000 0.000 0.000

# (h) Fluoride Furnace Scrubber.

#### PSNS FOR THE PRIMARY BERYLLIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (pounds per mill pounds) of boryll pebbles produced	
Beryllium Chrom:um (lotal) Copper Fluoride	0.818	0.760 0.331 1.345 44,100

,

(i) Chip Leaching.

# (c) Beryllium Carbonate Filtrate. PSNS FOR THE PRIMARY BERYLLIUM SUBCATEGORY Pollutant or pollutant property for any 1 for m

	day	average
	mg/kg (pounds per millior pounds) of beryllium ar bonate precipitated (as beryllium)	
Beryllium	175.900	72.930
Chromum (total)	79.360	32.170
Copper	274.600	130.900
Fluoride	7.507.000	4,290.000

# (d) Beryllium Hydroxide Filtrate.

PSNS FOR THE PRIMARY BERYLLIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (pounds per millior pounds) of beryllium hy droxide precipitated (ac beryllium)	
	droxide pre	
Beryllíum	droxide pre	
Chromum (total)	droxide pre beryllium)	cpitated (ac
Bery!!!ium Chrom:um (total) Copper	droxide pre beryllium) 43.180	17.910

#### PSNS FOR THE PRIMARY BERYLLIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly averago	
	mg/kg (pounds per million pounds) of benyilium metal leached		
Berytlium Chromium (total) Copper Fluoride	3.889 1.755 6.079 166.000	1.612 0.711 2.893 94.840	

#### § 421.157 [Reserved]

#### Subpart P-Primary Boron Subcategory

#### § 421.160 Applicability: Description of the primary boron subcategory.

The provisions of this subpart are applicable to discharges resulting from the production of boron by primary boron facilities processing boric oxide or diborane raw materials.

#### § 421.161 Specialized definitions.

For the purposes of this subpart the general definitions, abbreviations, and methods of analysis set forth in 40 CFR Part 401 shall apply to this subpart.

§§421.162-421.163 [Reserved]

§ 421.164 Standards of performance for new sources.

Any new source subject to this subpart shall achieve the following new source performance standards: (a) Reduction Product Acid Leachate.

#### NSPS FOR THE PRIMARY BORON SUBCATEGORY

Pollutant or Pollutant property	Maximum for any 1 day	Maximum for monthly averago
	mg/kg (pound pounds) powder pros	of boron
Lead Nickel Boron Total suspended sctids pH	61.490 281.100 162.08 6,003.000 ( <sup>1</sup> )	29.200 185.900 66 60 2,855.000 (')

(b) Baron Wash Water.

#### NSPS FOR THE PRIMARY BORON SUBCATEGORY

Pollutant or pollutant property	Maxemum for any 1 day	Maximum for monthly average	
	mg/kg (pounds per min pounds) of ben powder produced		
	13.990		
Lead	63,940	6.660 42,290	
Nickel	36.850	15.200	
Boron			
Total suspended solids	1.366.000	649.40	

#### NSPS FOR THE PRIMARY BORON SUBCATEGORY-Continued

0

הבידענון לכנינות דו נפוטים lar cay 1 Pellutant or pollutant property nЧ (\*) \* Within the range of 7.5 to 10.0 ct cli Lines.

#### § 421.165 [Reserved]

§ 421.166 Pretreatment standards for new sources.

Except as provided in 40 CFR 403.7, any new source subject to this subpart which introduces pollutants into a publicly owned treatment works must comply with 40 CFR Part 403 and achieve the following pretreatment standards for new sources. The mass of wastewater pollutants in primary boron process wastewater introduced into a POTW shall not exceed the following values: (a) Reduction Product Acid Leachate.

PSNS FOR THE PRIMARY BORON SUBCATEGORY Maximum fer manibly Maximum for ony 1 day Pollutant or pollutant property mine mg/kg (counds per million pounds) of baren powder preduced 29270 185870 6980 61 439 Load N.ckcl. 231 123 102,03 **Beron** 

# (b) Boron Wash Water.

PSNS FOR THE PRIMARY BORON SUBCATEGORY

Pollutant or pollutant property	Maximum for cry 1 doy	Maximum far monaldy Evenege
ng/kg (pounds por milion pounds) of boren powder produced		
Lood Nokol Boren	13.000 63.940 86.0000	6 CS0 42,230 15,200

#### § 421.167 [Reserved]

#### Subpart Q-Primary Cesium and **Rubidium Subcategory**

§ 421.170 Applicability: Description of the primary cesium and rubidium subcategory.

The provisions of this subpart are applicable to discharges resulting from the production of cesium or rubidium by primary cesium and rubidium facilities.

## § 421.171 Specialized definitions.

For the purposes of this subpart the general definitions, abbreviations and methods of analysis set forth in 40 CFR Part 401 shall apply to this subpart.

### §§ 421.172-421.173 [Reserved]

§ 421.174 Standards of performance for new sources.

Any new source subject to this subpart shall achieve the following new source performance standards:

(a) Spent Acid and Crystallizer Rinse Water from Cesium Production.

#### NSPS FOR THE PRIMARY CESIUM AND RUBIDIUM SUBCATEGORY

Peristant or peristant property	Noracry 1 for any 1 day	Maximum for menthly average
		ás per million politicata (Cs) d
Lead	3.705 18.530	1720
Z	13.500	5 559
Tetal autocreded solida	193.500	153.800
cH	e)	(°)

<sup>1</sup> Within the range of 7.5 to 10.0 at all times.

#### (b) Spent Acid and Crystallizer Rinse Water from Rubidium Production.

#### NSPS FOR THE PRIMARY CESIUM AND RUBIDIUM SUECATEGORY

Pellidert et polidert propetty	Maximum for any 1 day	Maximum for montby average
	mg/kg (pounds per mill pounds) of lepsia (Rb) ere digested	
Lead Thatian Zra Total successive colids pH	2.224 11.170 8.133 119.700 (')	1.037 4.543 3.351 \$5.750 (*)

Within the range of 7.5 to 10.0 at all times.

# § 421.175 [Reserved]

§ 421.176 Pretreatment standards for new sources.

Except as provided in 40 CFR 403.7, any new source subject to this subpart which introduces pollutants into a publicly owned treatment works must comply with 40 CFR Part 403 and achieve the following pretreatment standards for new sources. The mass of wastewater pollutants in primary cesium and rubidium process wastewater introduced into a POTW shall not exceed the following values: (a) Spent Acid and Crystallizer Rinse Water from Cesium Production.

#### PSNS FOR THE PRIMARY CESIUM AND RUBIDIUM SUBCATEGORY

Pellidant or palidant property	Maurum far any 1 day	Maxmum for manipay average
		ds per millon   politiota (Co)   d
Lcc1	3.705	1.720

PSNS FOR THE PRIMARY CESIUM AND RUBIDIUM SUBCATEGORY-Continued

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
Thatlium	18.530	7.543
Zinc	13.500	5.558

(b) Spent Acid and Crystallizer Rinse Water from Rubidium Production.

PSNS FOR THE PRIMARY CESIUM AND RUBIDIUM SUBCATEGORY

Pollutant or pollutant property	Maximum Maximum for any 1 for monthly day average	
		d per million of lepidolite gested
Lead Thallium Zinc	2.234 11.170 8.139	1.037 4.548 3.351

# § 421.177 [Reserved]

#### Subpart R—Primary and Secondary Germanium and Gallium Subcategory

§ 421.180 Applicability: Description of the primary and secondary germanium and gallium subcategory.

(a) The provisions of this subpart are applicable to discharges resulting from the production of germanium or gallium from primary and secondary germanium and gallium facilities.

(b) There are two levels of BPT, BAT. NSPS, PSES and PSNS provisions for this subpart. Level A provisions are applicable to facilities which only reduce germanium dioxide in a hydrogen furnace and then wash and rinse the germanium product in conjunction with zone refining. The level B provisions are applicable to all other facilities in the subcategory.

#### § 421.181 Specialized definitions.

For the purpose of this subpart the general definitions, abbreviations and methods of analysis set forth in 40 CFR Part 401 shall apply to this subpart.

§ 421.182 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available.

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart shall achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable technology currently available.

(a) Level A.

(1) Acid Wash and Rinse Water.

BPT LIMITATIONS FOR THE PRIMARY AND SEC-ONDARY GERMANIUM AND GALLIUM SUB-CATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (pound pounds) o washed	is per million I germanium
Arsen:c	325.500	133.900
Lead	65.400	31.150
Zinc	227.400	94.990
Germanium	68.520	28.030
Fluonda	5,450.000	3,115.000
Total suspended solids	6,385.000	3,037.000
pH	(1)	(1)

<sup>1</sup> Within the range of 7.5 to 10.0 at all times.

#### (b) Level B. (1) Still Liquor.

BPT LIMITATIONS FOR THE PRIMARY AND SEC-ONDARY GERMANIUM AND GALLIUM SUB-

CATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (pound pounds) o chlonnated	ds per million f german:um
Arsen:c	131.7000	54.180
Zinc	26.460 91.980	12.600 38.430
Germanium Fluoride	27.720 2,205.000	11.340 1,260.000
Total suspended solids	2,583.000 ( <sup>1</sup> )	1,229.000

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

### (2) Chlorinator Wet Air Pollution Control.

BPT LIMITATIONS FOR THE PRIMARY AND SEC-ONDARY GERMANIUM AND GALLIUM SUB-CATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
---------------------------------	-----------------------------	-----------------------------------

mg/kg (pounds per million pounds) of germanium chlonnated

Агзепіс	27.530	11.330
Lead	5.532	2.634
Zinc	19.230	8.034
Germanium	5.795	2.371
Fluoride	461.000	263,400
Total suspended solids	540.000	256.800
рН	(*)	(4)

\* Within the range of 7.5 to 10.0 at all times.

(3) Germanium Hydrolysis Filtrate.

BPT LIMITATIONS FOR THE PRIMARY AND SEC-ONDARY GERMANIUM AND GALLIUM SUB-CATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
		ds per million f germanium
Arsenic	39,440	16.230

BPT LIMITATIONS FOR THE PRIMARY AND SEC-ONDARY GERMANIUM AND GALLIUM SUB-CATEGORY-Continued

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
Zinc	27.550	11.510
Germanum	8.303	3.397
Fluorida	660.500	377.400
Total suspended solida	773.700	368.000
pH	( <sup>1</sup> )	( <sup>1</sup> )

\* Within the range of 7.5 to 10.0 at all times.

(4) Acid Wash and Rinse Water.

BPT LIMITATIONS FOR THE PRIMARY AND SEC-ONDARY GERMANIUM AND GALLIUM SUB-CATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly averago
	mg/kg (poundo por million poundo) of germanium washed	
Arsenic	325.500 65.400	133.900 31.150
Zinc German:um Fluoride	227.400 60.520	94.990 20.030
Total suspended solids	5,450.000 6,385.000 (1)	3,115.00 3,037.000 (1)

\* Within the range of 7.5 to 10.0 at all times.

(5) Gallium Hydrolysis Filtrate.

BPT LIMITATIONS FOR THE PRIMARY AND SEC-ONDARY GERMANIUM AND GALLIUM SUB-CATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (pound pounds) of drolyzed	do per million I gallium hy-
Arsenic	69.330	28.530
Lead	13.930	8.634
Zinc	48,430	20.240
German:um	14.600	5.971
Fluoride	1,181,000	603,400
Total suspended solids	1,360,000	649,800
рН	(4)	()

<sup>1</sup> Within the range of 7.5 to 10.0 at all times.

(6) Solvent Extraction Raffinate.

BPT LIMITATIONS FOR THE PRIMARY AND SEC-ONDARY GERMANIUM AND GALLIUM SUB-CATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (pounds per millio pounds) of gallium pro duced by solvent extrac- tion	
Arsenic	39.340	10,190
Lead	7.905	3.764
Zinc	27.480	11.480
Germanium	8.281	3.388
Fluoride	658.700	376,400
Total suspended solids	771.600	367.000
	ക	0

HWithin the range of 7.5 to 10.0 at all times.

§ 421.183 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable.

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

(a) Level A.

(1) Acid Wash and Rinse Water.

BAT LIMITATIONS FOR THE PRIMARY AND SEC-ONDARY GERMANIUM AND GALLIUM SUB-CATEGORY

Pollutant or pollutant property	Naximum for any 1 day	Maximum for monthly average
mg/kg (pounds per milion pounds) of germanium washed		
Arsen:c	325.500 65.400	133 920 31,150
Zinc Germanum Fluoride	227.400 68.520 5,450.000	94.990 28.030 3,115.000

(b) Level B.

(1) Still Liquor.

BAT LIMITATIONS FOR THE PRIMARY AND SEC-ONDARY GERMANIUM AND GALLIUM SUB-CATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly averago
		ds per millen f germanium

Arsen:c	87.570	35.910
Lead	17.640	8.190
Zinc	64.260	26.460
Germanum	23.310	9.450
Fluoride	2,205.000	1,280.000

# (2) Chlorinator Wet Air Pollution Control.

BAT LIMITATIONS FOR THE PRIMARY AND SEC-ONDARY GERMANIUM AND GALLIUM SUB-CATEGORY

Pollutant or pollutant property	Maxmum for any 1 day	Maximum for monitity averago
mg/kg (pounds per million pounds) of germanum chiomated		
Arsen:c Lead Zinc German:um Fluoride	18.310 3.639 13.440 4.873 461.009	7.507 1.712 5.532 1.976 263.400

(3) Germanium Hydrolysis Filtrate.

BAT LIMITATIONS FOR THE PRIMARY AND SEC-ONDARY GERMANIUM AND GALLIUM SUB-CATEGORY

Pellutant er pollutant proporty	Maximum far cay 1 cay	ניבריבין געריביין בעביינין
		ಚಿ per ಗ್ರಮಾ 1 - ಕ್ರಮಾರ್ಯವಾಗಿ
Arcente	2020) 5224	10763
Zinc	10220	7.959
Germanum	6002	2031
Fluchio	C22.023	377 493

#### (4) Acid Wash and Rinse Water.

BAT LIMITATIONS FOR THE PRIMARY AND SEC-ONDARY GERMANIUM AND GALLIUM SUB-CATEGORY

Peristant or polisiant property	Macrosoft for cry 1 cry	Maximum far manibay avanogo
rigiką (szurda por m. ca pozrác) el gomanum wochod		
Arsenie Leed Zuis Germar um Filienda	216503 43003 159603 57000 57000	07720 07227 05427 25427 25427 25427 25427 25427

## (5) Gallium Hydrolysis Filtrate.

BAT LIMITATIONS FOR THE FRIMARY AND SEC-ONDARY GERMANIUM AND GALLIUM SUB-CATEGORY

Pellutant or pollulant property	Max mum Ici city 1 City	איניגידער אין
	mgikg (poun poundo) di duchzed	da por milian I galium hys
Arschie Leed Zine	45 110 9273 33.249 12.270 1.161 023	18 910 4 312 13 633 4 976 6 73 499

#### (6) Solvent Extraction Raffinate.

BAT LIMITATIONS FOR THE PRIMARY AND SEC-ONDARY GERMANIUM AND GALLIUM SUB-CATEGORY

Pollutant or pollutant property	lincrum ler cry 1 dry	Maximum fer maraby everege
	peundo) el	is per millen gellem pro- chent extrap-
Arsenia Lead Zina Germanum Fluonda	25.169 5.270 19.209 6.904 9 653 709	10 700 2,447 7,505 2,823 376 459

§ 421.104 Standards of performance for now cources.

Any new source subject to this subpart shall achieve the following new source performance standards:

(a) Level A.

(1) Acid Wash and Rinse Water.

NSPS FOR THE PRIMARY AND SECONDARY GERMANIUM AND GALLIUM SUBCATEGORY

Poliziari er poliziari property	Maximum for any 1 day	Maximum for merchy average

_	ng/kg (cours pounds) ci wasted	lo per millen I germanum
	325.500-	133.500
[cod	65,430	31,150
7-3	227.400	94,930
Gomerum	63.520	23.030
Firsts	5,457020	3.115.000
Total successful solids	6.235.000	3.037.010
H	(1)	(1)

Within the range of 7.5 to 10.0 at all times.

#### (b) Level B. (1) *Still Liquor*.

NSPS FOR THE PRIMARY AND SECONDARY GERMANUM AND GALLIUM SUBCATEGORY

Remutant or pollutant property	Maximum for eny 1 day	Maximum for monthly average
mgrkg (pounds per milion pounds) el gennemum chiennaised		
Artona	87.570	35.910
Lcod	17 640	8.130
Zn::	64,260	26.450
Germanum	23.310	9 450
F2:: 10	2,295.000	1,280.000
Total suspended selide	945.000	756.000
FH	6)	0

\*Within the range of 7.5 to 10.0 at all times.

# (2) Chlorinator Wet Air Pollution Control.

NSPS FOR THE PRIMARY AND SECONDARY GERMANIUM AND GALLIUM SUBCATEGORY

Pollutani or pollutani proporty	Maximum for any 1 day	Maximum for monthly average
mg/kg (pounds per mile) pounds) of germanum chierrated		
Атот.е	18.310 3.623 13.440 4.873 4.873	7.507 1712 5.532 1.976 263.400
fold surgeried selfes	197.6CG (*)	153.1CO (?)

Vitton the range of 75 to 10.0 at all times.

#### (3) Germanium Hydrolysis Filtrate.

NSPS FOR THE PRIMARY AND SECONDARY GERMANIUM AND GALLIUM SUBCATEGORY

26428

Maximum for any 1	Maximum for monthly average
mg/kg (poun pounds) o hydrolyzed	ds per millior f german:un
26.230	10.760
5.284	2.453
19.250	7.926
6.982	2.831
660.500	377.400
283.100	226.500
	for any 1 day mg/kg (poun- pounds) o hydrolyzed 26.230 5.284 19.250 6.982

<sup>1</sup> Within the range of 7.5 to 10.0 at all times.

(4) Acid Wash and Rinse Water.

#### NSPS FOR THE PRIMARY AND SECONDARY GERMANIUM AND GALLIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
•	mg/kg (poun pounds) o	ds per million f german:um
,	washed	
Arsenic	216.500	88.760
Lead	43.600	20.250
Zinc	158.900	65.400
German:um[	57.620	23.360
Fluorido	5,450.000	3,115.000
Total suspended solids		

(1)

(1)

Within the range of 7.5 to 10.0 at all times.

οН

(5) Gallium Hydrolysis Filtrate.

#### NSPS FOR THE PRIMARY AND SECONDARY GERMANIUM AND GALLIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (pound pounds) of drohyzed	ds per million gallium hy-
A		
Arsenic	46.110	18.910
Lead	46.110 9.288	18.910
Lead Zinc Germanium	9.288	4.312
Lead Zinc Germanium Fluoride	9.288 33.840	4.312 13.930
Lead Zinc Germanium	9.288 33.840 12.270	4.312 13.930 4.976

<sup>1</sup> Within the range of 7.5 to 10.0 at all times.

(6) Solvent Extraction Raffinate.

NSPS FOR THE PRIMARY AND SECONDARY GERMANIUM AND GALLIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
		ds per million gallium pro- olvent extrac-
Arsenic	26.160	10.730
Lead	5.270	2.447
Zinc	19.200	7.905
Germanium	6.964	2.832
	658,700	376,400
Flouride	000.700	
Flouride Total suspended solids	282.300	225.900

Within the range of 7.5 to 10.0 at all times.

# § 421.185 Pretreatment standards for existing sources.

Except as provided in 40 CFR 403.7 and 403.13, any existing source subject to this subpart which introduces pollutants into a publicly owned treatment works must comply with 40 CFR Part 403 and achieve the following pretreatment standards for existing sources. The mass of wasfewater pollutants in primary and secondary germanium and gallium process wastewater introduced into a POTW must not exceed the following values: (a) Level A.

(1) Acid Wash and Rinse Water.

PSES FOR THE PRIMARY AND SECONDARY GERMANIUM AND GALLIUM SUBCATEGORY

-	Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
			ds per million f germanium
	Arsenic Lead Zinc Germanium Flouride	325.500 65.400 227.400 68.520 5,450.000	133.900 31.150 94.990 28.030 3,115.000

# (b) Level B.

(1) Still Lıquor.

PSES FOR THE PRIMARY AND SECONDARY GERMANIUM AND GALLIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (poun pounds) o chlonnated	ds per million 1 germanium
	chiomated	
Arsenic	87.570	35.910
Lead		35.910 8.190
ead	87.570	
Arsenic Lead Zinc	87.570 17.640	8.190

(2) Chlorinator Wet Air Pollution Control.

PSES FOR THE PRIMARY AND SECONDARY GERMANIUM AND GALLIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (poun	
	pounds) o chlonnated	f german:un
Arsenic		f german:un 7.507
Lead	chlonnated	
Lead Zinc	chlonnated 18.310	7.507
Lead	chlonnated 18.310 3.688	7.507

# (3) Germanium Hydrolysis Filtrate.

#### PSES FOR THE PRIMARY AND SECONDARY GERMANIUM AND GALLIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (pound poundo) o hydrolyzed	do per million 1 germanium
Arsenic Lead	28.230 5.284 19.250 6.982 660.500	10.760 2.453 7.028 2.831 377.400

# (4) Acid Wash and Rinse Water.

PSES FOR THE PRIMARY AND SECONDARY GERMANIUM AND GALLIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average	
	mg/kg (pounda per milik pounda) of germaniu washed		
Arsen:c	216.500	89.760	
Lead	43.600	20.250	
Zinc	158.900	65,400	
Germanium	57.620	23,360	
Flounde	5,450,000		

# (5) Gallium Hydrolysis Filtrate.

Pollutant

Fluorida

PSES FOR THE PRIMARY AND SECONDARY GERMANIUM AND GALLIUM SUBCATEGORY

or pollutant property	Maximum for any 1 day	Maximum for monthly average

mg/kg (pounds per million pounds) of gallium hydrotyzed

citing 288		
Arson:c	52.610	21.560
Lead	10.600	4.021
Zinc	38.610	15.900
Germanium	14.010	5.678
Flounde	1,325.000	757.000

# (6) Solvent Extraction Raffinate.

PSES FOR THE PRIMARY AND SECONDARY GERMANIUM AND GALLIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	pounds) of	do per million gallium pro- olvont extrac-
Arsenic Lead Zinc Germanium	26.160 5.270 19.200 0.964	10.730 2.447 7.905 2.823

# § 421.186 Pretreatment standards for new sources.

658,700

376,400

Except as provided in 40 CFR 403.7, any new source subject to this subpart which introduces pollutants into a publicly owned treatment works must comply with 40 CFR Part 403 and achieve the following pretreatment standards for new sources. The mass of wastewater pollutants in primary and secondary germanium and gallium process wastewater introduced into a POTW shall not exceed the following values:

(a) Level A.

(a) Acid Wash and Rinse Water.

PSNS FOR THE PRIMARY AND SECONDARY GERMANIUM AND GALLIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for menthly everage
	mg/kg (poun pounds) o washed	ds per millon f germanum
Arsen:c	325.500	133.900
Lead	65.400	31.150
Zinc	227.400	94,920
German:um	63.520	28.030

# (b) Level B.

(1) Still Liquor.

PSNS FOR THE PRIMARY AND SECONDARY GERMANIUM AND GALLIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maxmum for monthly average
mg/kg (pounds per mllon pounds) of germanum chlonnated		
Arsenic	87.570 17.640 64.260 23.310 2,205.000	35.910 8.190 26.460 9.450 1,260.000

#### (2) Chlorinator Wet Air Pollution Control.

PSNS FOR THE PRIMARY AND SECONDARY GERMANIUM AND GALLIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly averago
		ds per millen f germanum
Arsenic Lead	18.310 3.688 13.440	7.507 1.712 5.532

#### (3) Germanium Hydrolysis Filtrate.

PSNS FOR THE PRIMARY AND SECONDARY GERMANIUM AND GALLIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maxmum for monthly overoge
	mg/kg (poun pounds) o hydrolyzed	ds per millen f germanum
Arsen:c Lead	26.230 5.284	10.760 2.453

PSNS FOR THE FRIMARY AND SECONDARY GERMANIUM AND GALLIUM SUBCATEGORY-Continued

Pollutant or pollutant property	Maximum for ony 1 day	אמא איז איז איז איז איז איז איז איז איז אי
Zinc	19250	7.909
Germentum	6592	2831
Fluende	659550	377 409

# (4) Acid Wash and Rinse Water.

PSNS FOR THE PRIMARY AND SECONDARY GERMANIUM AND GALLIUM SUBCATEGORY

Pollutant or pollutant property	Maximum far any 1 day	איז
		is per milien 1. germanium
Arsenic Leod Zinc Germanum Fluenda	216.500 43.600 159.600 57.620 5,459.600	CO 769 20257 65 409 20200 3,115 609

#### (5) Gallium Hydrolysis Filtrate.

PSNS FOR THE PRIMARY AND SECONDARY GERMANIUM AND GALLIUM SUBCATEGORY

Pollutant or pollulant property	Mar Turn for any 1 day	Maumum far manshiy averaga
		isperni∐an Igii un hy-
Arscrite	46 110 9,223	18.910 4.312
ZincGerman:um	33.849 12.270	13.900 4.976
Fluor.do	1,161 099	653 450

#### (6) Solvent Extraction Raffinate.

PSNS FOR THE PRIMARY AND SECONDARY GERMANIUM AND GALLIUM SUBCATEGORY

Pellutant or pellutant preparty	Maximum fer cny 1 day	Maximum fer maniby everego
---------------------------------	-----------------------------	----------------------------------

Arsonic	mg/kg (pounds por millen pounds) of gellum pro- duced by selvent extrap- tion	
	20 100 5.270	10 730 2.447
Zine Germanium	10.200 6.254	7205 2023
Fluondo	E£3760	376 490

#### § 421.187 [Reserved]

#### Subpart S—Secondary Indium Subcategory

§ 421.190 Applicability: Description of the secondary Indium subcategory.

The provisions of this subpart are applicable to discharges resulting from the production of indium at secondary indium facilities processing spent

electrolyte solutions and scrap indium metal raw materials.

§ 421.191 Specialized definitions.

For the purpose of this subpart the general definitions, abbreviations, and methods of analysis set forth in 40 CFR Part 401 shall apply to this subpart.

§ 421.192-421.193 [Reserved]

§ 421.194 Standards of performance for new sources.

Any new source subject to this subpart shall achieve the following new source performance standards:

(a) Displacement Tank Supernatant.

NSPS FOR THE SECONDARY INDIUM SUBCATEGORY

Pellutant or pollutant property	Maximum for any 1 day	Maxmum for monthly average
		·

n

ng/kg	(;c	LFIC	ន	rer	mIIIc	n
poun	ds)	cf	ar.d	նսո	met	21
ರ್ಧಂತ್ರ	rcec	5				

Cedrum	1.233 1.733 6.314	0.435 0.805 2.600
indium	2291	0.929
Total cuspended selida	92.850	74.280
pH	(')	(')

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

#### (b) Spent Electrolyte.

#### NSPS FOR THE SECONDARY INDIUM SUECATEGORY

Pellidari er pellidari proporty	Maximum for any 1 day	Maxmum for monthly average
		is per millen mélum, metal
Codment	7.160	2.864
Lccd	10.030	4.654
Z-:	33.520	15.040
1	13.250	5.370
Tetal suspended solids	537,000	429.600
¢H	(')	(')

Within the range of 7.5 to 10.0 at all times.

#### § 421.195 Pretreatment standards for existing sources.

Excepts as provided in 40 CFR 403.7 and 403.13, any existing source subject to this subpart which introduces pollutants into a publicly owned treatment works must comply with 40 CFR Part 403 and achieve the following pretreatment standards for existing sources. The mass of wastewater pollutants in secondary indium process wastewater introduced into a POTW must not exceed the following values:

(a) Displacement Tank Supernatant.

PSES FOR THE SECONDARY INDIUM SUBCATEGORY

Pollutant or pollutant property	Maxamum for any 1 day	Maximum for monthly average
	malka loovo	ds per million
		indium metal
Cadmium	pounds) of	
Lead	pounds) of produced	indium metal
Cadmium Lead Zinc	pounds) of produced 2.105	0.929

# (b) Spent Electrolyte.

#### PSES FOR THE SECONDARY INDIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
		ds per million Indium metal

Cadmium 12.170 5.370 15.040 52.270 7.160 21.840 head. Zinc. Indium 15.750 6.444

#### § 421.196 Pretreatment standards for new sources.

Except as provided in 40 CFR 403.7. any new source subject to this subpart which introduces pollutants into a publicly owned treatment works must comply with 40 CFR Part 403 and achieve the following pretreatment standards for new sources. The mass of wastewater pollutants in secondary indium process wastewater introduced into a POTW shall not exceed the following values:

(a) Displacement Tank Supernatant.

#### PSNS FOR THE SECONDARY INDIUM SUBCATEGORY

Pollutant or pollutant property	Maxamum for any 1 day	Maximum for monthly average
		ds per million molum metal
Cadm!um	1.238	0.495
Lead	1.733	0.805
Zinc Indium	6.314 2.291	2.600 0.929
(a) Spent Electrolyt	е.	
PSNS FOR THE SEC SUBCATE		DIUM
Pollutant or pollutant property	Maximum for any 1	Maximum for monthly

	Day	average
	mg/kg (pound pounds) of refined	s per million Indium metal
Cadmium	7.160 10.030	2.864 4.654
Zino	36.520	15.040

### PSNS FOR THE SECONDARY INDIUM SUBCATEGORY-Continued

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
Indium	13.250	5.370

#### §421.197 [Reserved]

Subpart T-Secondary Mercury Subcategory

§421.200 Applicability: Description of the secondary mercury subcategory.

The provisions of this subpart are applicable to discharges resulting from the production of mercury from secondary mercury facilities processing recycled mercuric oxide batteries and other mercury containing scrap raw materials.

## §421.201 Specialized definitions.

For the purpose of this subpart the general definitions, abbreviations, and methods of analysis set forth in 40 CFR Part 4401 shall apply to this subpart.

#### §§ 421.202-421.203 [Reserved]

#### §421.204 Standards of performance for new sources.

Any new source subject to this subpart shall achieve the following new source performance standards:

# (b) Spent Battery Electrolyte.

Lead. Mercury .

NSPS FOR THE SECONDARY MERCURY
SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (poun pounds) of duced from	mercury pro-
Lead	0.030 0.016 1.590	0.014 0.005

Total suspend pH. (1) (1) Within the range of 7.5 to 10.0 at all times.

(b) Acid Wash and Rinse Water.

NSPS FOR THE SECONDARY MERCURY SUBCATEGORY

		average
	mg/kg (pound pounds) washed and	of mercury
Lead Mercury Total suspended solids pH	0.00056 0.00030 0.030 ( <sup>1</sup> )	0.00026 0.00012 0.024. (*)

#### NSPS FOR THE SECONDARY MERCURY SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average	
	mg/kg (pounds per million pounds) of mercury processed through fur- nace		
Lead Mercury Total suspended solids pH	0.000	0.000 0.000 0.000 (1)	

(1)

\* Within the range of 7.5 to 10.0 at all times.

#### § 421.205 [Reserved]

§ 421.206 Pretreatment standards for new sources.

Except as provided in 40 CFR 403.7, any new source subject to this subpart which introduces pollutants into a publicly owned treatment works must comply with 40 CFR Part 403 and achieves the following pretreatment standards for new sources. The mass of wastewater pollutants in secondary mercury process wastewater introduced into a POTW shall not exceed the following values:

(a) Spent Battery Electrolyte.

#### PSNS FOR THE SECONDARY MERCURY SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly avorago
		to pot million

pounds) of morcury pro-duced from batterios

	······	
Lead Mercury	. 0.030 . 0.016	

# (b) Acid Wash and Rinse Water.

#### PSNS FOR THE SECONDARY MERCURY SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average

		per million
		mercury
washed	t and r	Insed
r		

Lead. Mercury	0.00056 0.00030	

# (c) Furnace Wet Air Pollution Control.

#### PSNS FOR THE SECONDARY MERCURY SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	pounds)	do per millon of mercury through fur-
Lead	0.000	0.000

#### PSNS FOR THE SECONDARY MERCURY SUBCATEGORY-Continued

Pollutant or pollutant property	Maxemum for any 1 day	Maximum for monthly average
Mercury	0.000	0.000

#### § 421.207 [Reserved]

Subpart U—Primary Molybdenum and Rhenium Subcategory

§ 421.210 Applicability: Description of the primary molybdenum and rhenium subcategory.

The provisions of this subpart are applicable to discharges resulting from the production of molybdenum or rhenium by primary molybdenum and rhenium facilities.

#### § 421.211 Specialized definitions.

For the purpose of this subpart the general definitions, abbreviations, and methods of analysis set forth in 40 CFR Part 401 shall apply to this subpart.

§ 421.212 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available.

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

(a) Molybdenum Sulfide Leaching.

BPT LIMITATIONS FOR THE PRIMARY MOLYBDENUM AND RHENIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average	
	mg/kg (pounds per million pounds) of molybdonum sulfide leached		
Arsenic	0.968	0.333	
Lead	0.195	0.033	
Nickel	0.889	0.583	
Selenum	0.570	0.255	

Selentum	0.5/0 [	0.235
Molybdenum	2.680	1.100
Ammonia (as N)	61.350	26.970
Total suspended solids	18.990	9.029
oH	ല	( <sup>1</sup> )

<sup>1</sup> Within the range of 7.5 to 10.0 at all times.

(b) Roaster SO<sub>2</sub> Scrubber.

BPT LIMITATIONS FOR THE PRIMARY MOLYBDENUM AND RHENIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Morenteri for manaly evenage
mg/kg (szurda por milisa prunda) of milisa suifda (social		
Arson c. Lead. N.ckol. Selon um. Moytel onum. Ammon.a (as N). Total succendrat colida	3£13 0765 3224 2005 9765 223039 0765 223039 0765 223039 (')	1 444 0 525 2 153 0 524 3 555 6 3 335 5 2 749 (2)

\* Within the range of 7.5 to 100 ct cli Lines.

#### (c) Molybdic Oxide Leachate.

BPT LIMITATIONS FOR THE PRIMARY MOLYEDENUM AND RHENIUM SUBCATEGORY

Pollutant or pollutant property	Harry 1 Cry 1	Maximum far manaldy avaraga	
		is per milen 1. Ommenum medveci	
Arsenie	14 850	6 103	
Load	2.993	1 421	
NCckel	13649	9020	
Selen um	8733	35:5	
Molybdenum	41 000	16920	
Ammon.a (as N)	941 CCD	413700	
Total suspended selds	231223	103523	
cH.	(1)	()	

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

#### (d) Reduction Furnace Scrubber.

BPT LIMITATIONS FOR THE PRIMARY MOLYBDENUM AND RHENIUM SUBCATEGORY

Pellulant or pellulant property	Marchum for any 1 day	Maximum for manably svoroga	
		da por milian Imalycdonum 1203	
Arbenis Lead	47 EC0 9 617 43 970 C3 170 132 370 C 324 C0 E03 809 ( <sup>1</sup> )	19 £30 4 500 20 630 12 000 54 570 1634 600 446 500 (*)	
Within the range of 7.5 to 100 at all times. (e) Depleted Rhenium Scrubbing Solution.			
BPT LIMITATIONS FOR			

Pellutant or pollutant property

Arsento

Nickel.

Selon:um

Mehdenum

Ammonia (as N)

Lead

for manually

Granda

0616

0 143 0.913

0.334

1 170

41 700

mailea (counda por milion munobatem to (conuca perindo) of ma exiliato recettor 1 4 97

0.201

0631

4.140

84650

fer any 1

BPT LIMITATIONS FOR THE PRIMARY MOLYBOE-NUM AND RHEMUM SUBCATEGORY-Continusd

Rellators or pollators property	Listerum for any 1 day	Macrosoft for monthly average
Tel 4 suspended sel da	29.330	13.580
pH	(7)	(*)

"WOLD the range of 7.5 to 10.0 at all times.

§ 421.213 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically cchievable.

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart shall achieve the following effluent limitations representing the degree of effluent reduction altainable by the application of the best available technology economically achievable:

(a) Molybdenum Sulfide Leaching.

BAT LIMITATIONS'FOR THE PRIMARY MOLYBDENUM AND RHENIUM SUBCATEGORY

Pellutart or pollutart property	Macmum for eny 1 day	Maxmum for monthly average
		do per millen ' melybdorum hed
Arcono Leod Nated Selenum Matyatonum Amnana (es N)	0.644 0.133 0.255 0.320 1.790 61.359	0.264 0.060 0.171 0.171 0.730 26.970

# (b) Roaster SO<sub>2</sub> Scrubber.

BAT LIMITATIONS FOR THE PRIMARY MOLYBDENUM AND RHENIUM SUBCATEGORY

Pellutant er pallutant property	Macmum ler any 1 day	Mædmum for montbly averaga
		do por millon molybdorum tod
Аголіз Leof	2334 0.470 0.924 1.377 6.433 223.800	0.957 0.218 0.621 0.621 2.637 \$3.230

#### (c) Molybdic Oxide Leachate.

BAT LIMITATIONS FOR THE PRIMARY MOLYBDENUM AND RHENIUM SUBCATEGORY

Pellutant or pollutant property	Maximum far any 1 day	Maximum for morthly average
	mg/kg (sounds per million pounds) of emmorium molybdate produced	
Arcons	9.672 1.933 3.906	4.043 0.923 2.623

BAT LIMITATIONS FOR THE PRIMARY MOLYBDE-NUM AND RHENIUM SUBCATEGORY-Continued

26432

Pollutant or pollutant property	Maximum for any 1 day	Maxmum for monthly average
Selsnum	5.824	2.628
Molybdenum	27.440	11.220
Ammonia (as N)	941.000	413.700

#### (d) Reduction Furnace Scrubber.

BAT LIMITATIONS FOR THE PRIMARY MOLYBDENUM AND RHENIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (pounds per million pounds) of molybdenun metal produced	
Arsenic	3.183	1.308
Lead	0.641	0.298
Nickel	1.260	0.647
Selenium	1.878	0.647
Molybdenum	8.850	3.620
Ammonia (as N)	303.400	133,400

(e) Depleted Rhenium Scrubbing Solution.

#### BAT LIMITATIONS FOR THE PRIMARY MOLYBDENUM AND RHENIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (pounds per milli pounds) of molybdent sufide roasted	
Arsen:c	0.995	0.408
Lead	0.201	0.093
Nickel	0.394	0.265
Selenium	0.587	0.265
	2.770	1.130
Molybdenum Ammonia (as N)	2110	

#### § 421.214 Standards of performance for new sources.

Any new source subject to this subpart shall achieve the following new source performance standards:

(a) Molybdenum Sulfide Leaching.

NSPS LIMITATIONS FOR THE PRIMARY MOLYBDENUM AND RHENIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (poun pounds) of sulfide lead	molybdenum
Arsenic	0.644	0.264
Lead	0.130	0.060
Nickel	0.255	0.171
Selen:um	0.380	0.171
Molybdenum	1.790	0.730
Ammonia (as N)	61.350	26.970
Total suspended	8.945	5.556
pH	(Å	(1)

<sup>1</sup> Within the range of 7.5 to 10.0 at all times.

(b) Roaster SO<sub>2</sub> Scrubber.

# NSPS FOR THE PRIMARY MOLYBDENUM AND RHENIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average	
~	mg/kg (pounds per million pounds) of molybdsnum sulfide roasted		
Arsen:c Lead Nickel Selen:um Molvbdenum Anmona (as N) Total suspended solids	2.334 0.470 0.924 1.377 6.498 223.800 25.190	0.957 0.218 0.621 0.621 2.687 98.390 20.150	
рН	( <sup>1</sup> )	20.150 ( <sup>1</sup> )	

Within the range of 7.5 to 10.0 at all times.

# (c) Molybdic Oxide Leachate.

#### NSPS FOR THE PRIMARY MOLYBDENUM AND RHENIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (poun pounds) o molybdate j	f ammon:um
Arsenic	9.872	4.048
Lead	1.989	0.923
Nickel	3.906	2.628
Selen:um	5.824	2.628
Molybdenum	27.440	11.220
Ammon:a (as N)	941.000	413.700
Total suspended solids	106.600	85.230

Within the range of 7.5 to 10.0 at all times.

#### (d) Reduction Furnace Scrubber.

NSPS FOR THE PRIMARY MOLYBDENUM AND RHENIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day Average		
		ds per mällon molybdenum uced	
Arsen'c	3 183	1 308	

Lead	0.641	0.298
Nickel	1.260	0.847
Selenium	1.878	0.847
Molybdenum	8.850	3.620
Ammonia (as N)	303.400	133,400
Total suspended solids	34.350	27,480
pH	(1)	(4)

Within the range of 7.5 to 10.0 at all times.

(e) Depleted Rhenium Scrubbing Solution.

NSPS FOR THE PRIMARY MOLYBDENUM AND RHENIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
		ds per million molybdenum ited
Arsen:c	0.995	0.408
Lead	0.201	0.093
	0.394	0.265
N;Ck91	0.034	
	0.587	0.265
Nickel Selen:um Molybdenum Ammonia (as N)		

#### NSPS FOR THE PRIMARY MOLYBDENUM AND RHENIUM SUBCATEGORY-Continued

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly averago
Total suspended solids	10.740	0.592
pH	(¹)	(4)

\* Within the range of 7.5 to 10.0 at all times.

#### § 421.215 [Reserved]

# § 421.216 Pretreatment standards for new sources.

Except as provided in 40 CFR 403.7, any new source subject to this subpart which introduces pollutants into a publicly owned treatment works must comply with 40 CFR Part 403 and achieve the following pretreatment standards for new sources. The mass of wastewater pollutants in primary molybdenum and rhenium process wastewater introduced into a POTW shall not exceed the following values: (a) Molybdenum Sulfide Leaching.

#### PSNS FOR THE PRIMARY MOLYBDENUM AND RHENIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (poun pounds) of sulfide leas	molybdonum
Arsenic	0.644	0.264

7 W COI ICO 4000000000000000000000000000000000000	/ 0.044	0.204
Lead	0.130	030.0
Nicket	. 0.255	0.171
Selen:um		0.171
Molybdenum	1.780	0,730
Ammonia (as N)	61.350	20.970

# (b) Roaster SO<sub>2</sub> Scrubber.

#### PSNS FOR THE PRIMARY MOLYBDENUM AND RHENIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly averago
	mg/kg (pounds per millior pounds) of molybdonum sulfide reasted	
Arsen:c Lead Nickel	2.334 0.470 0.924	0.957 0.218 0.621
Selen:um Molyodanum Ammon:a (a3 N)	1.377 6.493	0.621 2.607 98.030

# (c) Molybdic Oxide Leachate.

#### PSNS FOR THE PRIMARY MOLYBDENUM AND RHENIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
		ds per million ammonium produced
Arsenic	9.872 1.989	4.048

PSNS FOR THE PRIMARY MOLYBDENUM AND RHENIUM SUBCATEGORY-Continued

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
Nickel	3.905	2.628
Selenum	5.824	2.628
Molybdenum	27.440	11.220
Ammona (as N)	941.000	413.700

### (d) Reduction Furnace Scrubber.

#### PSNS FOR THE PRIMARY MOLYBDENUM AND RHENIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
		ds per millon molybdenum

	metal produced	
Arsenic	3.183	1.306
Lead	0.641	0.293
Nickel	1.269	0.647
Selen:um	1.878	0.847
Mohbdenum	8.859	3.620
Ammonia (as N)	303.400	133,400

# (e) Depleted Rhenium Scrubbing Solution.

#### PSNS FOR THE PRIMARY MOLYBDENUM AND RHENIUM SUBCATEGORY

|--|

mg/kg (peunds per million nounds) of molytelenum sulfide roasted

Arsenic	0.995	0.403
Lead	0.201	0.093
Nickel	0.394	0.265
Selen:um	0.597	0.265
Molybdenum	2.770	1.130
Ammonsa (as N)	94.850	41.700

#### § 421.217 [Reserved]

#### Subpart V-Secondary Molybdenum and Vanadium Subcategory

§ 421.220 Applicability: Description of the secondary molybdenum and vanadium subcategory.

The provisions of this subpart are applicable to discharges resulting from the production of molybdenum or vanadium by secondary molybdenum and vanadium facilities.

# § 421.221 Specialized definitions.

For the purpose of this subpart the general definitions, abbreviations, and methods of analysis set forth in 40 CFR Part 401 shall apply to this subpart.

§ 421.222 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available.

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

BPT LIMITATIONS FOR THE SECONDARY MOLYBDENUM AND VANADIUM SUECATEGORY

Pollutant or pallutant property	Noximum Taricity 1 Coy	Managari for manually svorego
		ta por reilen mal/beterum um pratuced
Antmony Leed Nokel Mothefanum Ammonia (cs N) Total suspended set ds pH		18000 2503 15300 29800 700400 244 000 (1)

Within the range of 7.5 to 100 ct cll Lines

# (b) Molybdendum Filtrate.

BPT LIMITATIONS FOR THE SECONDARY MOLYBDENUM AND VANADIUM SUBCATEGORY

Pellulant or pellulant property	Maximum far any 1 day	Maxmin farinarady evenago
	mg/kg (prum prumio) ef produced	és por milien melybéonum
Antmony Lead	222,703 32,003 143,005 440,003 19,003,003 3,102,003 ( <sup>1</sup> )	67.837 15522 53.550 104 539 4,519 652 1,513.659 (*)

\* Within the range of 7.5 to 10.0 ct cll Lines

(c) Vanadium Decomposition Wet Air Pollution Control.

BPT LIMITATIONS FOR THE SECONDARY MOLYBDENUM AND VANADIUM SUBCATEGORY

Pollutant or pollutant property	Lizurur Ict cry 1 day	Maximum tar maraday everego
	prunac) (	is per millen el varessen y decorgest
Animeny	6530 6530 6530 6530 6530 6530 6530 (1)	6530 6630 6630 6630 6630 6630 6730 (1)

\* Within the range of 7.5 to 100 at all times

(d) Molybdenum Drying Wet Air Pollution Control.

#### BPT LIMITATIONS FOR THE SECONDARY MOLYEDENUM AND VANADIUM SUBCATEGORY

Follutant or pollutant property	Marcinium for any 1 day	Maxmum fax manihiy everage
		is per millen melybdorum
Art. 75.57	0.000	0.000
Lcot	0.000	0.000
N'tkcl	0.000	0.003
Mahdanim	0.000	032.0
Amminia (cs N)	0.000	0.000
Tetal sussended selids	0.000	0000
cH	(1)	(1)

<sup>1</sup> Witten the range of 7.5 to 10.0 at all times

§ 421.223 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable.

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

#### BAT LIMITATIONS FOR THE SECONDARY MOLYBDENUM AND VANADIUM SUBCATEGORY

Pellutant or pellutant property	Maximum for eny 1 day	Maximum for monthly overcige
		ds per millen melybdenum um produced
Альтопу Leed	24,200 3,511 6,637 43,450 1,651,000	10.730 1.630 4.640 19.810 760.430

# (b) Molybdenum Filtrate.

P

BAT LIMITATIONS FOR THE SECONDARY MOLYEDENUM AND VANADIUM SUBCATEGORY

Maximum	Maxmum
for any 1	for mentility
day	everage
	Maximum for any 1 day

	mg/kg (pound pounds) cf produced	a per millen melytelenum
Artm:ny	149.600	E5.740
Local	21.730	10.099
Notest.	42,630	23.710
Mahadanim	212.600	85.910
Armana (ca N)	269.770	122.543
	r	

(c) Vanadium Decomposition Wet Air Pollution Control.

BAT LIMITATIONS FOR THE SECONDARY MOLYBDENUM AND VANADIUM SUBCATEGORY

#### Maximum for monthly average Maximum Pollutant or pollutant property for any 1 day mg/kg (pounds per million pounds) of vanadium produced by decomposition Antimony 0.000 0.000 Leon. 0.000 0.000 Nicke 0.000 Molvodenum 0.000 0.000

0.000

0.000

#### (d) Molybdenum Drying Wet Air Pullution Control.

BAT LIMITATIONS FOR THE SECONDARY MOLYBDENUM AND VANADIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average	
	mg/kg (pounds per million pounds) of molybdenum produced		
Antimony	0.000	0.000	
Lead	0.000	0.000	
Nickel	0.030	0.000	
Molybdenum	0.000	0.000	
Ammonia (as N)	0.000	0.000	

#### § 421.224 Standards of performance for new sources.

Any new source subject to this subpart shall achieve the following new source performance standards: (a) Leach Tailings.

#### NSPS FOR THE SECONDARY MOLYBDENUM AND VANADIUM SUBCATEGORY

|--|

mg/kg (pounds per million pounds) of molybdenum and vanadium produced

Antimony	24.200	10.790
Lead	3.511	1.630
Nickel	6.897	4.640
Molybdenum	48.450	19.810
Ammonia (as N)	1,661,000	730,400
Total suspended solids	168,100	150.500
pH		-1)

\*Within the range of 7.5 to 10.0 at all times.

#### (b) Molybdenum Filtrate.

NSPS FOR THE SECONDARY MOLYBDENUM AND VANADIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maxumum for monthly average

mg/kg (pounds per million pounds) of molybdenum produced

-		
Antimony	149.800	66.740
Lead	21.730	10.090
Nickel	42.680	28.710
Molybdenum	299.770	122,540
Ammonia (as N)	10.280.000	4,519,000
Total suspended solids	1.164.000	931.200

NSPS FOR THE SECONDARY MOLYBDENUM AND VANADIUM SUBCATEGORY-Continued

Pollutant or pollutant property	Maximum for any 1 day	Maxiumum for monthly average
рН	(1)	(י)

<sup>1</sup> Within the range of 7.5 to 10.0 at all times.

(c) Vanadium Decomposition Wet Air Pollution Control.

NSPS FOR THE SECONDARY MOLYBDENUM AND VANADIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
---------------------------------	-----------------------------	-----------------------------------

mg/kg (pou			
pounds)			
produced	by	deco	mpos-
tion			

Antimony	0.000	0.000
Lead	0.000	0.000
Nickel	0.000	0.000
Molybdenum	0.000	0.000
Ammonia (as N)	0.000	0.000
Total suspended solids	0.000	0.000
pH	(1)	(4)

<sup>1</sup> Within the range of 7.5 to 10.0 at all times.

# (d) Molybdenum Drying Wet Air Pollution Control.

NSPS FOR THE SECONDARY MOLYBDENUM AND VANADIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (pound pounds) of produced	ds per million motybdenum
Antimony	0.000	0.000
Lead	0.000	0.000
Nickel	0.000	0.000
Molybdenum	0.000	0.000
Ammoma (as N)	.0.000	0.000
	0.000	0.000
Total suspended solids		

\* Within the range of 7.5 to 10.0 at all times.

#### § 421.225 [Reserved]

#### § 421:226 Pretreatment standards for new sources.

Except as provided in 40 CFR 403.7. any new source subject to this subpart which introduces pollutants into a publicly owned treatment works must comply with 40 CFR Part 403 and achieve the following pretreatment standards for new sources. The mass of wastewater pollutants in secondary molybdenum and vanadium process wastewater introduced into a POTW shall not exceed the following values:

(a) Leach Tailings.

#### PSNS FOR THE SECONDARY MOLYBDENUM AND VANADIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average	
	mg/kg (pounds per mill pounds) of molybdan and vanadium produc		
Antimony	24 200	10,790	
Lead	3.511	1.630	
Nickel	6 097	4 640	
Molybdanum	48,450	19.810	
Ammonia (as N)	1,661.000	730 400	

# (b) Molybdenum Filtrate.

#### PSNS FOR THE SECONDARY MOLYBDENUM AND VANADIUM SUBCATEGORY

Maximum for any 1 day	Maximum fot monthly average	
mg/kg (pounds por mill pounds) of mölybdani produced		
149.800	60.740	
21.730	10.030	
42 680	28.710	
299.770	122.540	
10,280.000	4,519.000	
	for any 1 day mg/kg (poun pounda) of produced 149.800 21.730 42.680 299.770	

(c) Vanadium Decomposition Wet Air Pollution Control.

#### PSNS FOR THE SECONDARY MOLYBDENUM AND VANADIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	poundo)	ds per million of vanadium y decompost-
Antimony	0.000	0.000
Lead	0.000	0.000
Nickel	0.000	0.000
Molybdenum	0.000	0.000
Ammonia (as N)	0.000	0.000

## (d) Molybdenum Drying Wet Air Pollution Control.

#### PSNS FOR THE SECONDARY MOLYBDENUM AND VANADIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monlity average
	mg/kg (poun pounds) of produced	ds per million molybdenum
Antimony	0.000	0 000
Lead	0.000	0.000
Lead Nickel	0.000	0.000
Lead		

26434

Ammonia (as N)...

Macan

for monthly

8161239

ratel

0.621

0.013

1.970

0.002

Maximum for menthy

aver279

7734 4.697

739.50

0 833

Maximum for morenty

C2213/3

13 650

7.917

14:3

1,245.000

BAT LIMITATIONS FOR THE PRIMARY NICKEL

AND COBALT SUBCATEGORY

Pollutions or pollutions property

12700

16 120

725520

Coppor

Mittel.

Ammenia (as N).

More

137 CT 1 CT 1

mg/kg (pounds per pounds) of

powder wached

0.043

0.019

4.430

#### BPT LIMITATIONS FOR THE PRIMARY NICKEL § 421.227 [Reserved]. AND COBALT SUBCATEGORY Subpart W-Primary Nickel and Cobalt Subcategory Мазлия Істолу 1 Сау Maximum for max30y avorago Pellutant or pollutant preparty § 421.230 Applicability: Description of the primary nickel and cobalt subcategory. mg/kg (pounds per millen pounds) et notket reduced The provisions of this subpart are applicable to discharges resulting from Copper 24 120 the production of nickel or cobalt by 24 300 N. skcl 1002000 Ammonia (es N). primary nickel and cobalt facilities Coha't. processing ore concentrate raw Total suspended solids. 603.603 materials. cН. (<sup>c</sup>) \* With the range of 7.5 to 100 at all times § 421.231 Specialized definitions. For the purpose of this subpart the (d) Cobalt Reduction Decant. general definitions, abbreviations, and methods of analysis set forth in 40 CFR BPT LIMITATIONS FOR THE PRIMARY NICKEL Part 401 shall apply to this subpart. AND COBALT SUBCATEGORY § 421.232 Effluent limitations guidelines Maxim la cy 1 cy Pollutant or pollutant preparty representing the degree of effluent reduction attainable by the application of the best practicable control technology mg/kg (prundo per milian prundo) el estalt reduced currently available. Except as provided in 40 CFR 125.30 49 609 Copper through 125.32, any existing point source Next 41 000 Ammenia (os N)... subject to this subpart shall achieve the 4434 Coball. following effluent limitations Total suspended selids 877.000 representing the degree of effluent (-) EH. reduction attainable by the application \* Within the range of 7.5 to 1969 at all times. of the best practicable technology currently available: § 421.233 Effluent limitations guidelines (a) Raw Material Dust Control. representing the degree of effluent reduction attainable by the application of BPT LIMITATIONS FOR THE PRIMARY NICKEL the best available technology economically AND COBALT SUBCATEGORY achievable. Maximum for monthly Except as provided in 40 CFR 125.30 Махалит Pollutant or pollutant property for any 1 through 125.32, any existing point source day averago subject to this subpart shall achieve the mg/kg (pounds per millen following effluent limitations pounds) pounds) of coppor. mokel, and cobait in the representing the degree of effluent crushed raw material reduction attainable by the application of the best available technology 0.146 0.077 Copper 0.148 economically achievable: Nickel. 0.033 Ammonia (as N). 10.260 4.400 (a) Raw Material Dust Control. Cobalt 0.016 0.007 Total suspended solids. 3 157 1.502 (4) (') BAT LIMITATIONS FOR THE PRIMARY NICKEL AND COBALT SUECATEGORY \* Within the range of 7.5 to 10.0 at all times. (b) Nickel Wosh Water. Pedulant or podulant property וכז בדין 1 BPT LIMITATIONS FOR THE PRIMARY NICKEL mg/kg (poundo por million poundo) of coppor, nuckel, and estall m tho errohad row malanal AND COBALT SUBCATEGORY Maximum for any 1 day Maximum Pollutant or pollutant property for monthly average 0 (33 Contor N.ckcl. 0 C42 matka (counds per millor 10:203 Ammonia (cs N) pounds) of n.ckcl powder washed Coto't 0.011 0.064 0.034 Copper Nickel. 0 065 0.043 (b) Nickel Wosh Water. Ammonia (as N) 4.510 0.003 Cobalt. 0.007 1.389 Total suspended solids 0.661 (P) (1) "Within the range of 7.5 to 10.0 at all times. (c) Nickel Reduction Decant.

pН

pH.

#### 247 ETO Caban 0.005 (') (c) Nickel Reduction Decant BAT LIMITATIONS FOR THE PRIMARY NICKEL AND COBALT SUBCATEGORY Maxmum far any 1 day Pallutant or pallutant property Maximum for manality Gvc:2;2;2 mg/kg (peunds per mulich peundo) of makel reduced Capper Makel 16 253 6.932 21 400 Ammana (22 N). 1,632,000 27 180 Catal 1.773 1,222 (3) 1926 417.200 (d) Cobalt Reduction Decant. (4) BAT LIMITATIONS FOR THE PRIMARY NICKEL AND COBALT SUBCATEGORY Maximum for any 1 day Pellutant or pollutant property mg/kg (poundo por millen poundo) of cobalt reduced Cappor 27,320 11.770 N.Stol. Arrana (as ti). 2,032,000 Catal 2535 § 421.234 Standards of performance for new sources. Any new source subject to this subpart shall achieve the following new source performance standards: (a) Raw Material Dust Control. Har-NSPS FOR THE PRIMARY NICKEL AND COBALT for marchy Eventsis SUBCATEGORY

Poliziari er poliziari property	Maximum for any 1 day	Mountum for mertily average
		of copper, octoit in the
Coppor Note: Ambrana (as N) Cobot: Total suspended colida pH	0.053 0.042 10.200 0.011 1.155 (*)	0.047 0.028 4.430 0.005 0.324 (*)
* Witton the range of 7.5 to 10	o at e3 tracs.	l

(b) Nickel Wash Water.

0.047

0.023

4400

0.005

NSPS FOR THE PRIMARY SUBCAT		D COBALT	PSN
Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average	Polluta
	mg/kg (pour pounds) powder wa	ids per million of nickel ished	
Copper	0.043	0.021	
Nickel Ammonia (as N)	0.019 - 4.490	0.013	Copper Nickel.
Cobalt	. 0.005	0.002	Ammon Cobait.
Total suspended solids pH	. 0.508 . ( <sup>1</sup> )	.0.407 (')	
<sup>1</sup> Within the range of 7.5 to 10	.0 at all times.	<u></u>	(b)
(c) Nickel Reductio	n Decant.		PSN
NSPS FOR THE PRIMARY SUBCATE		D COBALT	Polluta
Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average	
		ds,per million Ickol reduced	Copper.
Copper	16.250	7.744	Nickel
lickel	6.982	.5.697	Cobalt.
unmonia (as N) Cobalt	1,682.000	739.500 0.889	
otal suspended solids	290.400 ( <sup>1</sup> )	152.400	(c)
<sup>1</sup> Within the range of 7.5 to 10	L	(1)	PSNS
(d) Cobalt Reduction			Poliuta
NSPS FOR THE PRIMARY SUBCATE		D COBALT	
Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average	Copper Nickel
	mg/kg (poun pounds) of co	ds per million balt reduced	Ammoni Cobalt
Copper	27.390 11.770	13.050 7.917	(d)
mmonia (as N)	2,835.000	1,179.000	PSNS
otal suspended solids H	2.996 321.000	1.498 256.800	FONS
<sup>1</sup> Within the range of 7.5 to 10.	(1) O at all times.	(1)	Pollutar
421.235 [Reserved]		,	
421.236 Pretreatment	t standards	for new	Copper
Except as provided :	m 40 CEP	403 7	Nickel
ny new source subject			Cobalt
which introduces pollu	itants into	a	
ublicly owned treatm	ent works	must	
omply with 40 CFR Pa	art 403 and	3	§ 421.2
chieve the following	pretreatme	ent '	Subpa
tandards for new sou	rces. The	mass of	Subca
vastewater pollutants	ın prımar	y nickel	§ 421.2
nd cobalt process wa	stewater		secon
ntroduced into a POT exceed the following v		π	The
AUGEN THE TUHUWHUV $V$	auesi		applic

(a) Raw Material Dust Control.

49, No. 125 / Wed	lnesday,	June 27,
PSNS FOR THE PRIMARY SUBCATE		d Cobalt
Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	pounds)	ds per million of copper, cobalt in the w-material
	····	

PSNS FOR THE PRIMARY NICKEL AND COBALT

SUBCATEGORY

0.099

0.042

10 200

0.011

Махитит

for any day

0.047

0.028

4/480

0.005

Maximum for monthly average

0.021 0.013 1.970

0.002

mg/kg (pounds per million pounds) of nickel powder washed

0.043

0.019

4.490

.0.005

Ammonia (as N).

Ammonia (as N).

Pollutant or pollutant

(b) Nickel Wash Water.

Pollutant or pollutant property

§ 421.241 Specialized definitions.

For the purpose of this subpart the general definitions, abbreviations, and methods of analysis set forth in 40 CFR Part 401 shall apply to this subpart.

§§ 421.242-421.243 [Reserved]

§ 421.244 Standards of performance for new sources.

Any new source subject to this subpart shall achieve the following new source performance standards: (a) Slag Reclaim Tailings.

> NSPS FOR THE SECONDARY NICKEL SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
X	mg/kg (pounds per mill pounds) of slag recla n.ckel produced	
Chromium (total) Copper Nickel Total suspended solido pH	37.670 162.700 164.400 3,510.000 (')	15.410 85.600 108.700 1,669.000 (')

<sup>1</sup> Within the range of 7.5 to 10.0 at all times.

#### (b) Acid Reclaim Leaching Filtrate.

#### PSNS FOR THE PRIMARY NICKEL AND COBALT NSPS FOR THE SECONDARY NICKEL SUBCATEGORY

property	Maximum for any 1 day	Maximum for monthly average	Pollutant or pollutant property

	mg/kg (pounds pounds) of nicl	
Copper	16.250 6.982	7.744
Ammonia (as N) Cobalt	1,682,000	739.50

SUBCATEGORY

(d) Cobalt Reduction Decant.

(c) Nickel Reduction Decant.

PSNS FOR THE PRIMARY-NICKEL AND COBALT SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (poun	ds per million

, pounds) of cobalt reduc		balt reduced
Copper	27.390	13.050
Nickel	11.770	7.917
Ammon:a (as N)	2,835.000	1,179.000
Cobalt	2.996	1.498

#### § 421.237 [Reserved]

#### Subpart X—Secondary Nickel Subcategory

§ 421.240 Applicability: Description of the secondary nickel subcategory.

The provisions of this subpart are applicable to discharges resulting from the production of nickel by secondary nickel facilities processing slag, spent acids, or scrap metal raw materials.

# mg/kg (pounds per million pounds) of acid reclaim nickel produced

Maximum

for any 1 day

Maximum

for monthly

average

Chrom:um (total) Copper Nickel Total suspended solida	6.394 2.747 74.930	0,749 3.047 1.848 59.940 (1)
--	--------------------------	--

<sup>1</sup> Within the range of 7.5 to 10.0 at all times.

(c) Acid Reclaim Leaching Belt Filter Backwash.

#### NSPS FOR THE SECONDARY NICKEL SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (poun pounds) of nickel prod	acid reclaim
Chromium (total) Copper Nickel Total suspended solids	0.444 1.535 0.660 17 990 (')	0.180 0.731 0 444 14 390 (')

\* Within the range of 7.5 to 10.0 at all times.

#### § 421:245 Pretreatment standards for existing sources.

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

PSNS FOR THE SECONDARY NICKEL

SUBCATEGORY

ואים דו

Pailutent or pailutent property

glay-

לבתביח בכל בערכינים

representing the degree of effluent reduction attainable by the application of the best practicable technology currently available:

(a) Smelter Wet Air Pollution Control.

#### BPT LIMITATIONS FOR THE PRIMARY PRECIOUS METALS AND MERCURY SUBCATEGORY

Pellidant or pollutant proper	ty for any 1 for any 1 for	Maximum for monitily avorage
	ಗ್ರಾ/ರಶ್ರ ಯುಂ ಮುನ್ s	a of gold and mailed
Arca:	27.532	11,350
Lcod	5.544	2.640
Namy	3350	1.320
E.Ver	5.412	2244
Z.m	19.270	8.052
03 cmd Groces	284.000	153.400
Tetal suspended selids	541200	257.400
£Н	(')	6 0

\* Within the range of 7.5 to 10.0 at all times.

(b) AgCl Reduction Spent Solution.

#### BPT LIMITATIONS FOR THE PRIMARY PRECIOUS METALS AND MERCURY SUBCATEGORY

Pelliciant or polliciant property	Maximum for any 1 day	Maximum for monthly average
		co of siver ny siver solu- on
ATCT:::	823.0	0.344
Lead	0.163	0.020
Moreury	0.100	0.040
EN:C	0.164	0.063
Zno	0.534	0.244
03 ETJ Greeco	8.000	4.800
Total suspended selles	16.430	7.800
çH	6	e)

\* Witten the range of 7.5 to 10.0 at all times.

## (c) Electrolytic Cells Wet Aur Pollution Control.

#### BPT LIMITATIONS FOR THE PRIMARY PRECIOUS METALS AND MERCURY SUBCATEGORY

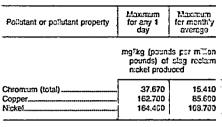
Pellutani er pollutani preperty	Maximum for any 1 day	Maximum for monthly average
		nco of gold cholytically
Arcas	413.810	170.210
Lood	83,160	33,600
L'orarry	49.500	19,800
ENG	81.1ED	<b>33.660</b>
Z	263,100	120.800
01 273 Greasa	3,950,000	2,376,000
Total successed of selling	8,118.000	3.861.000
cH Ka	· (1)	(1)

Within the range of 7.5 to 10.0 at all times.

(d) AgNO3 Electrolyte Preparation Wet Air Pollution Control.

# treatment works must comply with 40 CFR Part 403 and achieve the following pretreatment standards for existing sources. The mass of wastewater pollutants in secondary nickel process wastewater introduced into a POTW must not exceed the following values: (a) Slag Reclaim Tailings.

PSES FOR THE SECONDARY NICKEL SUBCATEGORY



# (b) Acid Reclaim Leaching Filtrate.

PSES FOR THE SECONDARY NICKEL SUBCATEGORY

Pollutant or pollutant property	Maximim for any 1 day	Maxmum for monthly average
		ds per millen Bad reals:m Joed
Chromeum (total)	1.848	0.749
	1 0.0.0-4	1.848

(c) Acid Reclaim Leaching Belt Filter Backwash.

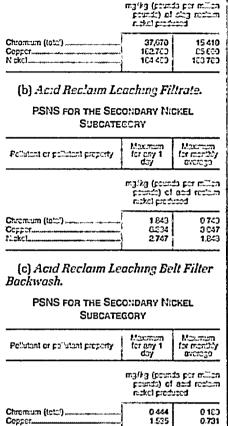
## PSES FOR THE SECONDARY NICKEL SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maxmum for monthly sverage
	mg/kg (pounds per mill pounds) of acid reda nickel produced	
	0.444	0.160
Chrom:um (total) Copper	1.535	0.731

#### § 421.246 Pretreatment standards for new sources.

Except as provided in 40 CFR 403.7. any new source subject to this subpart which introduces pollutants into a publicly owned treatment works must comply with 40 CFR Part 403 and achieve the following pretreatment standards for new sources. The mass of wastewater-pollutants in secondary nickel process wastewater introduced into a POTW shall not exceed the following values:

(a) Slag Reclaim Tailings.



§ 421.247 [Reserved]

Nickel.

## Subpart Y—Primary Precious Metals and Mercury Subcategory

§ 421.250 Applicability: Description of the primary precious metals and mercury subcategory.

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The provisions of this subpart are applicable to discharges resulting from the production of gold, silver, or mercury by primary precious metals and mercury facilities.

§ 421.251 Specialized definitions.

For the purpose of this subpart the general definitions, abbreviations, and methods of analysis set forth in 40 CFR Part 401 shall apply to this subpart.

§ 421.252 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available.

Except as provided in 40 CFR 125.30

BPT LIMITATIONS FOR THE PRIMARY PRECIOUS METALS AND MERCURY SUBCATEGORY

Pollutant or pollutant property	Maxamum for any 1 day	Maximum for monthly average
	mg/troy ound electrolyte	
Arcen!c	0.105	0.043
Lead	0.021	0.010
Mercury	0.013	0.005
Mercury Silver	0.013 0.021	0.005
Mercury Silver Zinc		
Silver Zinc	0.021	0.009
Silver	0.021 0.073	0.009 0.031

<sup>1</sup> Within the range of 7.5 to 10.0 at all times.

# (e) Ag Crystals Wash Water.

#### BPT LIMITATIONS FOR THE PRIMARY PRECIOUS METALS AND MERCURY SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
		nce of silver washed
Arsenic	0.608	0.249
Lead	0.122	0.058
Morcury	0.073	0.029
Silver	0.119	0.049
Zinc	0.423	0.177
Oil and Grease	5.800	3.480
Total suspended solids	11,890	5 655

(4)

(1)

Arsenic Lead....

<sup>1</sup> Within the range of 7.5 to 10.0 at all times.

pH.

(f) Gold Slimes Acid and Water Wash.

#### BPT LIMITATIONS FOR THE PRIMARY PRECIOUS METALS AND MERCURY SUBCATEGORY -

Pollutant or pollutant property	Maximum Maximum for any 1 for monthly day average	
	mg/troy ou slimes	
Arsenic	8.360	3.440
Logd	1.680	0.800
Mercury	1.000	0.400
Silver	1.640	0.680
Zinc	5.840	2.440
Oil and Grease	60.003	48.000
Total suspended solids	164.000	78.000
pH	(*)	(*)

<sup>1</sup> Within the range of 7.5 to 10.0 at all times.

(g) Calciner Wet Air Pollution Control.

#### BPT LIMITATIONS FOR THE PRIMARY PRECIOUS METALS AND MERCURY SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
		ds per million mercury con-
Arsenic	388.800	160.000
Lead	78.120	37.200
Mercury	46.500	18.600
Silver	76.260	31.620
Zinc	271.600	113.500
Oil and Grease	3,720.000	2,232.000
Total suspended solids	7.626.000	3.627.000

BPT LIMITATIONS FOR THE PRIMARY PRECIOUS METALS AND MERCURY SUBCATEGORY— Continued

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

<sup>1</sup> Within the range of 7.5 to 10.0 at all times.

(h) Calcine Quench.

BPT LIMITATIONS FOR THE PRIMARY PRECIOUS METALS AND MERCURY SUBCATEGORY

Pollulant or pollutant property	Maximum for any 1 day	Maximum for monthly average
---------------------------------	-----------------------------	-----------------------------------

mg/kg (pounds p	
pounds) of mer densed	rcury con-
echoou	

Arsen:c	35.790	15.140
Lead	7.392	3.520
Mercury	4.400	1.760
Silver	7.216	2.992
Zinc	25.700	10.740
Oil and Grease	352.000	211.200
Total suspended solids	721.600	343.200
pH	(*)	(1)

<sup>3</sup> Within the range of 7.5 to 10.0 at all times.

(i) Stack Gas Cooling.

BPT LIMITATIONS FOR THE PRIMARY PRECIOUS METALS AND MERCURY SUBCATEGORY

	Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
--	---------------------------------	-----------------------------	-----------------------------------

mg/kg (pound pounds) of dansed	ds per million mercury con-
 8.674	3.569
 1.743	0.830
 1.038	0.415

	111010017	1.000	0.410
	Silver	1.702	0.706
	Zinc	6.059	2.532
	Oil and Grease	83.000	49.800
	Total suspended solids	170.200	60.930
	pH	(1)	( <sup>1</sup> )
·			

<sup>1</sup> Within the range of 7.5 to 10.0 at all times.

(j) Hg Calcining Condensate.

BPT LIMITATIONS FOR THE PRIMARY PRECIOUS METALS AND MERCURY SUBCATEGORY

Pollutant or pollulant property	Maxemum for any 1 day	Maximum for monthly average
	mg/kg (pound pounds) of densed	ds per million mercury con-
Arsenic	28.840	11.870
Lead	5.796	2.760
Mercury	3.450	1.380
Silver	<ul> <li>5.658</li> </ul>	2.346
Zinc	20.150	8.418
Oil and Grease	276.000	165.600
Total suspended solids	565.800	269.100
	(4)	(A)

# (k) Hg Cleaning Bath.

#### BPT LIMITATIONS FOR THE PRIMARY PRECIOUS METALS AND MERCURY SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
		da per million marcury con-
Arsen:c	2.926	1 204
Lead	0.588	0 280
Mercury	0.350	0,140
Silver	0.574	0 238
Zinc	2.044	0.054
Oil and Grease	28.000	10 800
Total suspended solids	57.400	27.300
oH	(1)	(1)

<sup>1</sup> Within the range of 7.5 to 10.0 at all times

§ 421.253 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable.

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

(a) Smelter Wet Air Pollution Control.

BAT LIMITATIONS FOR THE PRIMARY PRECIOUS METALS AND MERCURY SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly averago
mg/troy ource of gold and		

	silver sme	silver smelted	
Arsen'c	1.807	0 741	
Lead	0.364	0,169	
Mercury	0,195	0 078	
Silver	0.377	0,150	
Zinc	1.326	0.540	

## (b) AgCl Reduction Spent Solution.

BAT LIMITATIONS FOR THE PRIMARY PRECIOUS METALS AND MERCURY SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
		co of silver ny silver solu- on
Arsenic	0.556	0 228

nC	0.408	0,169
V6f		0.040
EICUTY		0.024
ad		0.052
596;C	0.556	0220

(c) Electrolytic Cells Wet Aır Pollution Control.

Me Sil Zir

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Lead

Silver.

Lead.

Silver

Zinc.

Lead

Silver

Zinc

Lead

Silver

Zinc

Zinc

#### BAT LIMITATIONS FOR THE PRIMARY PRECIOUS BAT LIMITATIONS FOR THE PRIMARY PRECIOUS BAT LIMITATIONS FOR THE PRIMARY PRECIOUS METALS AND MERCURY SUBCATEGORY METALS AND MERCURY SUECATEGORY METALS AND MERCURY SUBCATEGORY Maximum for monthly average Maximum Maximum far mantaby Nacinati far eny 1 day Maximum les mentely for ments average Pollutant or pollutant property for any 1 day Pollutant or pollutant preparty tri Policiant or policiant property 007 G.C.C.C.C.C m3/k3 (pounds per million pounds) of monoury con-concod m3/Fg (poundo por milion poundo) of moreary con-donocal ma/troy ounce of actd refined electrolyteally 27.520 11.290 Arsemo 12540 1.245 5.544 2.574 Arcon's 29522 0.753 Lcod. 0.182 Mercury 2.970 1.163 Lead 6100 2893 Moreury 3200 1200 Magazy 0.210 0024 5.742 2.376 Nor. 0473 8.316 200 0.163 Slice. 0.000 20.200 1.472 Zna . 0.573 22 643 Zine. 0200 (d) AgNO3 Electrolyte Preparation (h) Calcine Quench. § 421.254 Standards of performance for Wet Air Pollution Control. new sources. BAT LIMITATIONS FOR THE PRIMARY PRECIOUS BAT LIMITATIONS FOR THE PRIMARY PRECIOUS Any new source subject to this METALS AND MERCURY SUBCATEGORY METALS AND MERCURY SUBCATEGORY subpart shall achieve the following new source performance standards: Maximum for monally average Maximum for any 1 day Max.num for monthly Pollutant or pallutant property 101 CTY 1 (a) Smelter Wet Air Pollution Control. Pollutant or pollutant property 8700003 NSPS FOR THE PRIMARY PRECIOUS METALS הקואס (גביניס) אסי הנוויס איניס אסייס איניס mg/troy cunce of silver in electrolyte produced AND MERCURY SUBCATEGORY Maximum for monthly Maximum 0.070 0.023 Arsenic Pollutant or pollutant property far eny 1 day 24 470 Arconia 10 000 0.014 0.007 evarage 2200 Lced. 4.003 Mercury 0.003 0.003 2640 Mercury 0.015 0.006 mg/tray curses of gold and silver smalled Shar. 5 104 2.112 0.021 0.051 Zine. 17.250 7.532 1 807 0.741 Amon Lcad. 0.169 (e) Ag Crystals Wash Water. 0.254 (i) Stack Gas Cooling. Mereury 0.155 0.078 Nor. 0.377 0.156 BAT LIMITATIONS FOR THE PRIMARY PRECIOUS Zine\_\_\_\_\_\_ Ol and Greece 0.548 1 339 BAT LIMITATIONS FOR THE PRIMARY PRECIOUS 13.000 13,000 METALS AND MERCURY SUBCATEGORY METALS AND MERCURY SUBCATEGORY Total suspended selles 19.500 15.600 (1) cH. (') Maximum Maximum for monthly average ארבייניבא ניגריינים אבל for any 1 day Pollutant or pollutant property for any 1 day \* Witton the range of 7.5 to 10.0 at all times. Pollutant or pollutant property 8:07833 (b) AgCl Reduction Spent Solution. mg/troy ounce of silver mg/kg (pounds por milion pounds) of moroury con-consod crystals washed NSPS FOR THE PRIMARY PRECIOUS METALS 0.403 0.165 AND MERCURY SUBCATEGORY Arsenic 0.081 0.033 Arsonia 5.703 2200 Mercury 0.044 0.017 Maximum for monthly . 0.540 Lcad 1.162 0.084 0.035 Feliziant or poliziant property for nov 1 0240 Mercury 0.623 dr SVER239 0.296 0.122 Sliver. 1204 1.743 Zinc 4.000 my/boy curso of silver produced by silver solu-tion reduction (f) Gold Slimes Acid and Water Wash. (j) Hg Calcining Condensate. 0.556 0.223 Arectic Lood..... 0.112 0.052 BAT LIMITATIONS FOR THE PRIMARY PRECIOUS BAT LIMITATIONS FOR THE PRIMARY PRECIOUS 0.060 0.024 METALS AND MERCURY SUBCATEGORY METALS AND MERCURY SUBCATEGORY 0.116 End 0043 0.163 OJ and Grands 4.000 4.000 Maximum for monthly averago Maximum far manady Maximum KEICITUM CEI CITY 1 CEIY Total suspended solids 4.200 Pollutant or pollutant property for any 1 day 6.000 Pollutant or pollutant property cН (2)(\*) 8400030 \*With the range of 7.5 to 10.0 at all times. mg/kg (pounds per millen pounds) el mensury sen-denced mg/tray ounce of getd stimes washed (c) Electrolytic Cells Wet Air Pollution Control. 2.280 Arsenco 5.560 0.520 1.120 Arcenie 19 180 7£19 Mercury 0.600 0.240 Lcad. 3.EC4 1.734 NSPS FOR THE PRIMARY PRECIOUS METALS Mercury 2.070 1.160 0.480 0.000 AND MERCURY SUBCATEGORY 1.055 1.650 Siver 4 0 7 2 4.080 Zine 14 030 5.729 Macmum Maximum for mentily Faliziant or poliziant property for any 1 (g) Calciner Wet Air Pollution C.T G.C.C.S.S (k) Hg Cleaning Bath. Control. mg/tray curses of gold rained electrolytically 27.520 11,290 Locd...... Moreary 5.544 2.970 2.574 1.123 5.742 2.376

#### NSPS FOR THE PRIMARY PRECIOUS METALS AND MERCURY SUBCATEGORY-Continued

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
Zinc	20.200	8.316
Oil and Grease	198.000	198.000
Total suspended solids	297.000	237.600
pH	(1)	( <sup>1</sup> )

Within the range of 7.5 to 10.0 at all times.

(d) AgNO3 Electrolyte Preparation Wet Air Pollution Control.

#### NSPS FOR THE PRIMARY PRECIOUS METALS AND MERCURY SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
*		e of silver un produced

Arsenic	0.070	0.029
Lead	0.014	0.007
Mercury	0.008	0.003
Silvar	0.015	0.006
Zinc	0.051	0.021
Oil and Grease	0.500	0.500
Total suspended solids	0.750	0.600
pH	_ (P)	(*)

\*Within the range of 7.5 to 10.0 at all times.

#### (e) Ag Crystals Wash Washer.

NSPS FOR THE PRIMARY PRECIOUS METALS AND MERCURY SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/troy ounce of silver crystals washed	
Arsen:c	0.403	0.165
Lead	0.081	0.038
Mercury	0.044	0.017
Silver,	0.084	0.035
Zinc	0.296	0.122
Oil and Grease	2.900	2.900
Total suspended solids	4.350	3.480

(1)

(1)

Within the range of 7.5 to 10.0 at all times.

Total suspended solids.

вH.

(f) Gold Slimes Acid and Water Wash.

#### NSPS FOR THE PRIMARY PRECIOUS METALS AND MERCURY SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/troy ou stimes	
Arsenic	5,560	2.280
Lead	1,120	0.520
Mercury	0.600	0.240
Silver	1.160	0.480
Zinc	4.080	1.680
Oil and Grease	40.000	40.000
Total suspended solids	60.000	48.000
pH	(1)	(1)

<sup>1</sup>Within the range of 7.5 to 10.0 at all times.

(g) Calciner Wet Air Pollution Control.

NSPS FOR THE PRIMARY PRECIOUS METAL	s
AND MERCURY SUBCATEGORY	

Maximum for any 1 day Maximum for monthly average Pollutant or pollutant property mg/kg (pounds per million pounds) of mercury condensed

Агзелю	30.580	12.540
Lead	6.160	2.860
Mercury	3.300	1.320
S:lver	6.380	2.640
Zinc	22.440	9.240
Oil and Grease	220.000	220.000
Total suspended solids	330.000	264.000
pH	(*)	(+)

<sup>1</sup>Within the range of 7.5 to 10.0 at all times.

# (h) Calcine Quench.

NSPS FOR THE PRIMARY PRECIOUS METALS AND MERCURY SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (poun pounds) of densed	ds per million mercury con
Arsen:c	24.470	10.03
Lead	4.928	2.28
Mercury	2.640	1.05
Silver	5.104	2.11
Zinc	17.950	7.39
Oil and Grease	176.000	176.00
Total suspended solids	264.000	211.20
	(1)	e (*

\*Within the range of 7.5 to 10.0 at all times.

#### (i) Stack Gas Cooling.

NSPS FOR THE PRIMARY PRECIOUS METALS AND MERCURY SUBCATEGORY

		. <u> </u>
Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (pounds per million pounds) of mercury con densed	
Arsen:c	5,769	2,366
Lead	1.162	0.540
Mercury	0.623	0.249
Silver	1.204	0.498
Zinc	4,233	1.743
Oil and Grease	41,500	41.500
Total suspended solids	62.250	49.800
pH	(1)	(*)

\* Within the range of 7.5 to 10.0 at all times.

## (j) Hg Calcining Condensate.

NSPS FOR THE PRIMARY PRECIOUS METALS AND MERCURY SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (poun pounds) of densed	ds per millon mercury con-
Arsenic	19.180	7.866
Lead	3.864	1.794
Mercury	2.070	0.828
Silver	4.002	1.656
Zinc	14.080	5.796
Oil and Grease	138.000	138.000
Total suspended solids	207.000	165.600

#### NSPS FOR THE PRIMARY PRECIOUS METALS AND MERCURY SUBCATEGORY-Continued

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
рН	(1)	(7

\*Within the range of 7.5 to 10.0 at all times.

#### (k) Hg Cleaning Bath.

#### NSPS FOR THE PRIMARY PRECIOUS METALS AND MERCURY SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly averago

mg/kg (pounds per million pounds) of mercury con-

	UNISBU	
Arsen:c	1.946 0.392 0.210	0,798 0,182 0,084
Silver Zinc Oil and Greaso Total suspended solido	0.406 1.428 14.000 21.000 ( <sup>1</sup> )	0.168 0.588 14 000 16.800 (')

Within the range of 7.5 to 10.0 at all times.

#### § 421.255 [Reserved]

#### § 421.256 Pretreatment standards for new sources.

Except as provided in 40 CFR 403.7, any new source subject to this subpart which introduces pollutants into a publicly owned treatment works must comply with 40 CFR Part 403 and achieve the following pretreatment standards for new sources. The mass of wastewater pollutants in primary precious metals and mercury process wastewater introduced into a POTW shall not exceed the following values: (a) Smelter Wet Air Pollution Control.

#### **PSNS FOR THE PRIMARY PRECIOUS METALS** AND MERCURY SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/troy ounce of gold an silver smelled	
Arsen:c Lead Mercury Silver Zinc.	0.377	0 741 0 169 0 078 0 150 0 546

# (b) AgCl Reduction Spent Solution.

#### PSNS FOR THE PRIMARY PRECIOUS METALS AND MERCURY SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly avotago
	mg/troy ounce of sth produced by silver so tion reduction	
Arsenic	0.556 0.112	0.228

26440

PSNS FOR THE PRIMARY PRECIOUS METALS AND MERCURY SUBCATEGORY—Continued

Pollutant or pollutant property	Maximum for any 1 day	Maximum fer monthly everege
Mercury Silver Zinc	0.060 0.116 0.408	0.024 0.049 0.163

#### (c) Electrolytic Cells Wet Aır Pollution Control.

#### PSNS FOR THE PRIMARY PRECIOUS METALS AND MERCURY SUBCATEGORY

Maximum for any 1 day	Maximum for mentily averegs
mg/troy cunce of gold refined electrolytically	
27.520 5.544	11.23) 2.574
2.970	1.189
5.742	2.376
20.200	8.316
	for any 1 day mg/troy or refined ets 27.520 5.544 2.970 5.742

#### (d) AgNO3 Electrolyte Preparation Wet Aır Pollution Control.

#### PSNS FOR THE PRIMARY PRECIOUS METALS AND MERCURY SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 dsy	Maximum for monthly average
	mg/troy ounce of silver b electrolyte produced	
Arsen:	0.070	0.023
Lead	0.014	0.007
Mercury	0.008	0.003
Silver	0.015	0.006
Zinc	0.051	0.021

# (e) Ag Crystals Wash Water.

#### PSNS FOR THE PRIMARY PRECIOUS METALS AND MERCURY SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average		
	mg/troy ounco of silver crystolo washed			
Arsenio Lead Mercury Silver Zinc	0.403 0.091 0.044 0.084 0.296	0.165 0.033 0.017 0.035 0.122		
(f) Gold Slimes Acid and Water Wash.				
PSNS FOR THE PRIMARY PRECIOUS METALS AND MERCURY SUBCATEGORY				
	Maximum	Maximum		

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
		nce of gold washed
Arsenic	5.560 1.120 0.690	2.289 0.520 0.249

#### PSNS FOR THE PRIMARY PRECIOUS METALS AND MERCURY SUBCATEGORY—Continued

Pollutant or pollutant property	Macrum for eny 1 day	Maximum for menticly average
S:Yer	1 100 4 000	0400 1600

#### (g) Calciner Wet Air Pollution Control.

#### PSNS FOR THE PRIMARY PRECIOUS METALS AND MERCURY SUBCATEGORY

Pollutant or pollutant property	Maximum for ony 1 doy	Maximum for monthly average
	mgikg (poun poundo) ai doncod	ಮ per ಣ್ಣಾನ ಗ್ರಾಮಾಗಿ ಹಲ್-
Arecho Leod Mercury S. Wer, Zitto	C2552 64C2 33C2 6C03 2249	12540 2690 1320 2640 9240

# (h) Calcine Quench.

PSNS FOR THE PRIMARY PRECIOUS METALS AND MERCURY SUBCATEGORY

Pollutant or pollutant property	Maximum for ony 1 day	Maximum for manify protogo

alles learneds and

	formation of m domod	
Arcenus	24,470 4.903 2.640 5.104	10 950 2200 1 059 2112 7,532
Zn:	17.850	7-23

# (i) Stack Gas Cooling.

PSNS FOR THE PRIMARY PRECIOUS METALS AND MERCURY SUBCATEGORY

Pollutant or pollutant property	Martin for city 1 city	Maximum for manoby evonego
	mgikg (poun poundo) ci doncod	נכיייש גראייט אייט אייט איינט אוינטטא
Arcores	57C) 1162	2003 0549
Mercury	063	0243

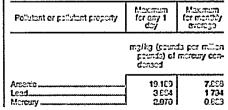
#### (j) Hg Calcining Condensate.

Zine

PSNS FOR THE PRIMARY PRECIOUS METALS AND MERCURY SUBCATEGORY

4233

1.743

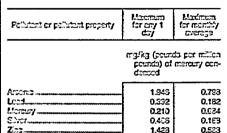


#### PSNS FOR THE PRIMARY PRECIOUS METALS AND MERCURY SUBCATEGORY-Continued

Pallatant or pollutant property	Maximum for eny 1 day	Maximum for monody average
Shet	4.002 14.530	1.653 5.796

# (k) Hg Cleaning Bath.

#### PSNS FOR THE PRIMARY PRECIOUS METALS AND MERCURY SUBCATEGORY



## § 421.257 [Reserved]

Subpart Z—Secondary Precious Metals Subcategory

 $\S$  421.260 Applicability: description of the secondary precious metals subcategory.

The provisions of this subpart are applicable to discharges resulting from the production of precious metals at secondary precious metals facilities.

§ 421.261 Specialized definitions.

For the purpose of this subpart: (a) Except as provided below, the general definitions, abbreviations, and methods of analysis set forth in 40 CFR Part 401 shall apply to this subpart.

(b) The term "precious metals" shall mean gold, platinum, palladium, rhodium, indium, osmium, and ruthenium.

§ 421.262 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available.

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

(a) Furnace Wet Air Pollution Control.

BPT LIMITATIONS FOR PRECIOUS METALS			BPT LIMITATI PRECIOUS
Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average	Pollutant or pollutant
	metals, inc	e of precious luding silver, ugh furnace	
Copper Cyanide (total)	136.400 20.820	71.800 8.616	Copper Cyanide (total)
Zinc	104.800	43.800	Zinc
Ammonia (as N) Tolal suspended solids		4,205.000	Ammonia (as N) Total suspended solids
рН	2,544.000	(1)	pH
<sup>1</sup> Within the range of 7.5 to 10.	0 at all times.		<sup>1</sup> Within the range of
(b) Raw Material G	ranulatior	ı.	(f) Gold Solv
BPT LIMITATIONS FOR	THE SECO	NDARY	and Wash Wat
PRECIOUS METALS	SUBCATEG	ORY	BPT LIMITATI
· · · · · · · · · · · · · · · · · · ·	·····	·	PRECIOUS
Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average	
	ma/Irmi auno	e of precious	Pollutant or pollutant
	metal cont	ained in the al which is	
Copper		0.000	Copper
Cyanıde (lotal) Zinc		0.000	Cyanide (total)
Ammonia (as N)	0.000	0.000	Zinc Ammonia (as N)
Fotal suspended solids pH	0.000 (¹)	0.000 (۱)	Total suspended solids
<sup>1</sup> Within the range of 7.5 to 10.	0 at all times.		pH
(c) Spent Plating Sol			<sup>1</sup> Within the range of
BPT LIMITATIONS FOR PRECIOUS METALS Pollutant or pollutant property	SUBCATEGO Maximum for any 1		BPT LIMITATIO PRECIOUS
	day	average	Pollutant or pollutant
	mg/Lter of solution us material	ed as a raw	
Copper Cyan:de (total)	1.900 0.290	1.000 0.120	Copper
Zinc	1.460	0.610	Cyan:de (total)
Ammonia (as N)	133.300	58.600	Zinc Ammonia (as N)
Fotal suspended solids DH	41.000 ( <sup>1</sup> )	19.500 (۱)	Total suspended solids
<sup>1</sup> Within the range of 7.5 to 10.			pH
(d) Spent Cyanide S		olutions.	<sup>1</sup> Within the range of
BPT LIMITATIONS FOR			(h) Gold Prec
PRECIOUS METALS			BPT LIMITATIO PRECIOUS
Pollutant or pollutant property	for any 1 day	for monthly average	Pollutant or pollutant j
	mg/troy ounc metals proc n:de stripp::	luced by cya-	
Сорраг	2.090	1.100	Copper
Cyanide (total)	0.319	0.132	Cyanide (total)
Zinc Ammonia (as N)	1.606 146.800	0.671 64.420	Ammonia (as N)
Total suspended solids	45.100	21.450	Total suspended solids
рН	(*)	(1)	pH
<sup>1</sup> Within the range of 7.5 to 10.		_	<sup>1</sup> Within the range of
(e) Refinery Wet An Control.	r Pollution	1	(i) Platinum I Filtration.

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49, INU. 123 / VVet	mesuay,	June 27,	1904
BPT LIMITATIONS FOR THE SECONDARY PRECIOUS METALS SUBCATEGORY			
Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average	Polluta
		e of precious cluding silver, refinery	
Copper Cyanide (total) Zinc Ammonia (as N) Total suspended solids pH	6.030 30.660 2,802.000 861.000 ( <sup>1</sup> )	21,000 2.520 12.810 1,230.000 409.500 ( <sup>1</sup> )	Copper. Cyanide Zinc Ammon Total su pH
<sup>•</sup> Within the range of 7.5 to 10 (f) Gold Solvent Ext and Wash Water.		affinate	(j) . Filtro
BPT LIMITATIONS FOR PRECIOUS METALS			B.
Pollutant or pollutant property	Maxmum for any 1 day	Maximum for monthly average	Polluta
	mg/troy our produced b traction pro	y solvent ex-	Copper.
Copper Cyanide (total) Zinc Ammonia (as N) Total suspended solids pH	1.197 0.183 0.920 84.070 25.830 ( <sup>1</sup> )	0.630 0.076 0.384 36.890 12.290 ( <sup>1</sup> )	Cyanide Zinc Ammon Total su pH <sup>1</sup> Witt
Within the range of 7.5 to 10 (g) Gold Spent Elect	_		(k) <i>Preci</i>
BPT LIMITATIONS FOR PRECIOUS METALS			Bl
Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average	Polluta
	mg/tfoy our produced t refining	nce of gold by electrolytic	
Copper Cyan:de (total) Zinc Ammon:a (as N) Total suspended solids pH	1.160	0.009 0.001 0.005 0.510 0.170 ( <sup>1</sup> )	Coppar. Cyanide Zinc Ammoni Total su pH
<sup>1</sup> Within the range of 7.5 to 10	.0 at all times.		• With
(h) <i>Gold Precipitation</i> BPT Limitations for			(l) 3 Prodi
PRECIOUS METALS			BI
· · · · · · · · · · · · · · · · · · ·	Maxamum	Maximum	

t property	Maximum for any 1 day	Maximum for monthly average	Pollutant
mg/troy ounce of gold procipitated			

Copper	8.360	4.400
Cyanide (total)	1.276	0.528
Zinc	6.424	2.684
Ammonia (as N)	583.800	257.700
Total suspended solids	180.400	85.800
PH	( <sup>1</sup> )	(¹)

<sup>1</sup> Within the range of 7.5 to 10.0 at all times.

(i) Platinum Precipitation and Filtration.

~

#### BPT LIMITATIONS FOR THE SECONDARY PRECIOUS METALS SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum fot monthly avotago
	mg/troy ounce of platir precipitated	
Сорраг	9.860	5 200
Cyanide (total)	1.508	0 024
Zinc	7.592	3,172
Ammonia (as N)	693,800	304.600
Total suspended colids	213,200	101,400
рН	(!)	(4)

<sup>1</sup> Within the range of 7.5 to 10.0 at all times.

(j) Palladium Precipitation and Filtration.

BPT LIMITATIONS FOR THE SECONDARY PRECIOUS METALS SUBCATEGORY

Poliutant or pollutant property	Maximum for any 1 day	Maximum for monthly average

#### mg/troy ounce of palladium precipitated

6.650	3.500
1.015 5.110 467.000 143.500 ( <sup>1</sup> )	0,420 2,135 205 000 60,250 ( <sup>1</sup> )
	5.110 467.000

<sup>1</sup> Within the range of 7.5 to 10.0 at all times.

#### (k) Other Platinum Group Metals Precipitation and Filtration.

#### BPT LIMITATIONS FOR THE SECONDARY PRECIOUS METALS SUBCATEGORY

Pollutant or Pollutant Property	Maximum for any 1 day	Maximum for monthly average
		ce of other group metals
Copper Cyanide (total) Zinc Ammonia (as N) Total suspended solids pH	9.880 1.508 7.592 693.900 213.200 (')	5.200 0.624 3.172 304 500 101.400 (')

Within the range of 7.5 to 10.0 at all times.

(1) Spent Solutions from PGC Salt Production.

#### BPT LIMITATIONS FOR THE SECONDARY PRECIOUS METALS SUBCATEGORY

Pollutant or Pollutant Property	Maximum for any 1 day	Maximum for monthly average
	ma/tróv ou	nco of gold

contair	ned in	PGC	prod	uct

Copper	1.710	0.900
Cyanide (total)	0.261	0,160
Zinc		0.549
Ammonia (as N)	120,100	52,760
Total suspended selids	36.900	17.550
рН	(!)	()

Within the range of 7.5 to 10.0 at all times.

(m) Equipment and Floor Wash.

#### 26443 BAT LIMITATIONS FOR THE SECONDARY BAT LIMITATIONS FOR THE SECONDARY BPT LIMITATIONS FOR THE SECONDARY PRECIOUS METALS SUBCATEGORY PRECIOUS METALS SUBCATEGORY PRECIOUS METALS SUBCATEGORY Maximum for mandidy average Махалиал Гог алу 1 бау Maximum for monthly average Maximum for monthly Maximum Follutant or Follutant Preparty Pallytant or pallytant preparty Pollutant or Pollutant Property far ary 1 for any 1 **d**3 average mg/Ltor of spont ploting solution used as a row mg/bay curse of gold produced by electrolyte mg/troy ounce of other precious metals, including silver, produced in matorni ic.ining refinery 0.610 0.011 0.005 1,220 Coppor Cyando (Lata). Copper Cyanida (total) 0 620 0.002 0.001 0.000 0.000 0:00 Copper Cyanide (total) 0.000 0.000 Zinc 1 000 0.420 Zine. 0.009 0.004 0.000 Ammonia (es N). 133.373 6983 Ammenia (23 K). 1,160 0.510 0.000 Zinc Ammon:a (as N). 0.000 0.000 Total suspended solids 0.000 0.000 pH. (1) (4) (h) Gold Precipitation and Filtration. (d) Spent Cyanide Stripping Solutions. Within the range of 7.5 to 10.0 at all times. BAT LIMITATIONS FOR THE SECONDARY BAT LIMITATIONS FOR THE SECONDARY PRECIOUS METALS SUBCATEGORY PRECIOUS METALS SUBCATEGORY § 421.263 Effluent limitations guidelines representing the degree of effluent Maximum for monthly Maximum for monitoly svorogo Macmun Max main fer eny 1 day reduction attainable by the application of Pallutant or pallutant property for any 1 day Pollutant or pollutant preparty avera3a the best available technology economically achievable. mg/bay curso of process motols processed by eyamg/troy cunce of gold preaptated Except as provided in 40 CFR 125.30 nido ctraging through 125.32, any existing point source 5.632 2.684 Capped subject to this subpart shall achieve the 1403 0 671 Cyando (tata) 0.820 0352 Copper Cyanida (total). Zine 020 0033 Zac 4.423 1.643 following effluent limitations 1 122 0492 Ammonia (co Ni) 593,800 257.700 representing the degree of effluent Ammonia (as N) 146 8.00 64 420 reduction attainable by the application (i) Platinum Precipitation and of the best available technology (e) Refinery Wet Air Pollution Filtration. economically achievable: Control. (a) Furnace Wet Air Pollution Control. BAT LIMITATIONS FOR THE SECONDARY BAT LIMITATIONS FOR THE SECONDARY PRECIOUS METALS SUBCATEGORY BAT LIMITATIONS FOR THE SECONDARY PRECIOUS METALS SUBCATEGORY PRECIOUS METALS SUBCATEGORY Maxmum for monthly Pellytert or pellytert property Maximum for ony 1 day for any 1 day Mars for manach Maximum for monthly Pollutant or pollutant preparty average .aximum Pollutant or Pollutant Property for any 1 CYC/CTCTO everage da, mg/troy curse of platnum mg/bray curso of proseus motels, instituting editor, preduced in reflecty preparated mg/troy ounce of precious metals, including silver, 6.658 3.172 Cepper routed through furnace C,:::::) .... 1.040 0.416 5334 Copper 1.220 0 610 2184 Zne. 2.745 5.760 0000 Copper Cyanido (total). 0200 Ammonia (co N) .... 304.500 633.900 Cyanice (total) 0.900 0.360 Zine. 1 020 4 590 1.890 Zinc Ammenia (co N). 133 222 50610 600.500 263.500 Ammon:a (as N). (j) Palladium Precipitation and Filtration. (f) Gold Solvent Extraction Raffinate (b) Raw Material Granulation. and Wash Water. BAT LIMITATIONS FOR THE SECONDARY PRECIOUS METALS'SUBCATEGORY BAT LIMITATIONS FOR THE SECONDARY BAT LIMITATIONS FOR THE SECONDARY PRECIOUS METALS SUBCATEGORY PRECIOUS METALS SUBCATEGORY Maximum for monthly evorage Maximum far any 1 day Pollutant or pollutant property Maximum for monthly Maxmum Maximum for maniphy Pollutant or Pollutant Property for any day 101 0.77 1 037 Pollutant or pollutant preparty averaga CECUCICO 20 mg/bay curce of pallatium preophated mg/troy ounce of precious maitrey curato of gold produced by colvert exmatals contained in the raw material which is 2135 Copper\_\_\_\_\_ Cyperio (1212) -----4.433 trantion pressoo 0.709 0.230 granulated Zaa. 3.570 1 470 0004 205.000 0813 Ammana (as 17)-457.010 0.000 0.000 Coscer Coppe Cyando (total). 0 128 0.051 Cyanide (total) 0.000 0.000 0 643 Zinc 0105 Tine 0.000 0.000 Ammenia (as NJ. 84 070 00830 0.000 0.000 Ammon:a (as N) (k) Other Platinum Group Metals Frecipitation and Filtration. (g) Gold Spent Electrolyte. (c) Spent Plating Solutions.

#### BAT LIMITATIONS FOR THE SECONDARY NSPS FOR THE SECONDARY PRECIOUS METALS NSPS FOR THE SECONDARY PRECIOUS METALS PRECIOUS METALS SUBCATEGORY SUBCATEGORY SUBCATEGORY Maximum for monthly average Maximum for any 1 day Maximum Maximum Maximum for monthly for monthly average for any 1 day Pollutant or pollutant property Pollutant or pollutant property averago mg/troy ounce of other mg/troy ounce of precious mg/troy ounce of gold produced by solvent explatinum group metals precipitated metals, contained in the raw material which is traction process granulated 3 172 Copper 0.806 0.416 Copper 0.000 0.000 Cyanida (total) 0.126 Cyanide (total). 0.000 0.000 Zinc. 2.184 Zinc. 304 500 Ammonia (as N) 84.070 Ammonia (as N)..... Total suspended solids 0.000 0.000 Total suspended solids 9,450 0.000 0.000 pH. è DH. (1) (1) Within the range of 7.5 to 10.0 at all times, <sup>1</sup> Within the range of 7.5 to 10.0 at all times. (g) Gold Spent Electrolyte. (c) Spent Plating Solutions. NSPS FOR THE SECONDARY PRECIOUS METALS NSPS FOR THE SECONDARY PRECIOUS METALS SUBCATEGORY SUBCATEGORY Maximum Maximum for monthly Maximum for any 1 day Maximum for monthly Pollutant or pollutant property for any 1 day Pollutant or pollutant property average average mg/troy ounce of gold produced by electrolytic rofining rng/liter of spent plating solution used as a raw matenal 1.280 Coppe 0.610 0.011 Copper Cyanide (total) 0 200 0.080 Cyanide (total). Zinc..... 0.002 1.020 linc Ammonia (as N)..... Ammonia (as N). 133 300 58,600 1.160 Total suspended solids. 12.000 15.000 0.131 pH. (1) (1) pH. (1) <sup>1</sup> Within the range of 7.5 to 10.0 at all times. <sup>1</sup>Within the range of 7.5 to 10.0 at all times. (d) Spent Cyanide Stripping Solutions. (h) Gold Precipitation and Filtration. NSPS FOR THE SECONDARY PRECIOUS METALS NSPS FOR THE SECONDARY PRECIOUS METALS SUBCATEGORY SUBCATEGORY Maximum Maximum Pollutant or pollutant property Maximum for monthly average for any 1 day for monthly Maximum average Pollutant or pollutant property for any 1 day mg/troy ounce of precious metals produced by cyamg/troy ounce of gold precipitated nide stripping Coppe 0.671 Copper 5.632 1.408 Cyan:de (total). Cyanide (total). 0.220 0.088 0.880 Zinc. 1.122 Zinc. 4.468 Ammonia (as N)..... Total suspended solids Ammonia (as N) 583 800 146.800 64.420 Total suspended solids .... 66.000 16.500 13,200 рH (1) (1) DH. (1) <sup>1</sup> Within the range of 7.5 to 10.0 at all times. • <sup>1</sup>Within the range of 7.5 to 10.0 at all times. (e) Refinery Wet Air Pollution (i) Platinum Precipitation and Control. Filtration. NSPS FOR THE SECONDARY PRECIOUS METALS NSPS FOR THE SECONDARY PRECIOUS METALS SUBCATEGORY SUBCATEGORY

ium	Pollutant or pollutant property	Maximum	Maximum
nthly		for any 1	for monthly
ige		day	average
nous ilver,		mg/troy ound precip	
0.610	<ul> <li>Copper</li> <li>Cyanide (tota)</li> <li>Zinc</li> <li>Ammonia (as N)</li> <li>Total suspended solids</li> <li>pH</li> </ul>	6.650	3,172
0.080		1.040	0,416
0.420		5.304	2,104
0.600		693.900	304,500
2.000		78.000	62,400
( <sup>1</sup> )		(')	(')

0 384

0.051

0.265

30.000

7.560

0.005

0.001

0.510

0.104

2.684

0.352

1.840

257.700

52.800

(')

0

(')

Within the range of 7.5 to 10.0 at all times.

(j) Palladium Precipitation and Filtration.

(1) Spent Solutions from PGC Salt Production.

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Cooper

Zinc.

Cyanide (total) ..

Ammonia (as N).

Pollutant or pollutant property

#### BAT LIMITATIONS FOR THE SECONDARY PRECIOUS METALS SUBCATEGORY

Maximum

for any 1 day

6 6 5 6

1.040

5.304

693 900

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
		ince of gold PGC product

Copper	1.152	0.549
Cyanide (tota)	0.180	0.072
Zinc	0.918	0.378
Ammonia (as N)	120.100	52.700

(m) Equipment and Floor Wash.

## BAT LIMITATIONS FOR THE SECONDARY PRECIOUS METALS SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
		e of precious
	metals, inc produced in	cluding silver, n refinery
Coppor Cyanide (total) Zinc		

## § 421.264 Standards of performance for new sources.

Any new source subject to this subpart shall achieve the following new source performance standards: (a) Furnace Wet Air Pollution Control.

NSPS FOR THE SECONDARY PRECIOUS METALS SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average	
	mg/troy ounce of pre metals, including routed through furn		
Copper	0.000	0.000	
	0.000	0.000	
Cyanide (total)			
Zinc	0.000	0.000	
Cyanide (total) Zinc Ammonia (as N)	0.000 0.000		
Zinc		0.000 .000 0.000	

Within the range of 7.5 to 10.0 at all times.

(b) Raw Material Granulation.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
		e of precious duding silver,

	produced in refinery	
Copper	1.280	0.610
Cyanide (total)	0.200	0.080
Zinc	1.020	0.420

<sup>1</sup> Within the range of 7.5 to 10.0 a	at all times.	
Ammonia (as N) Total suspended solids pH	133.300 15.000 ( <sup>1</sup> )	58.6 12.0
Zinc	1.020	0.4

(f) Gold Solvent Extraction Raffinate

and Wash Water.

NSPS FOR THE SECONDAI SUBCATE		IS METALS	s e
Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average	a te
	mg/troy palladium p		P tu
Copper Cyanide (total) Zinc Ammonia (as N)	4.4ED 0.700 3.570 467.000	2.135 0.280 1.470 205.000	p s
Total suspended solids	52.500 {'}	42.000 ( <sup>1</sup> )	p p P
k) Other Platinum (k) Other Platinum ( Precipitation and Filti)	Group Me	tals	ν
NSPS FOR THE SECONDAL SUBCATE		IS METALS	F 
-Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly averago	
	mg/troy. oun platinum g precipitated	ce of other proup metals	c
Copper Granide (total)	6.656 1.040	3.172 0.416	c z
Zinc	5.304	2.184	A
Ammon:a (as N) Total suspended solids	693.900 78.000	304.500 62.400	- 1
pH	(')	(*)	
(1) Spent Solutions f Production. NSPS FOR THE SECONDAT	RY PRECIOL		
SUBCATE Pollutant or pollutant property	GORY Maxemum for any 1 day	Maximum for monthly average	
		nce of gold PGC product	
Copper	1.152	0.549	A -
Cyanide (total)	0.180 0.918	0.072 0.378	
Ammonia (as N) Total suspended solids	120.100 13.500	52.700 10.600	
рН	(')	(')	F
<sup>1</sup> Within the range of 7.5 to 10.	0 at all times.		_
(m) Equipment and .	Floor Was	sh.	
NSPS FOR THE SECONDAL SUBCATE		IS METALS	-
Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average	С С
	mg/troy ound metals, ind produced in	auding silver.	Z A 
Copper Cyaride (total) Zinc Ammonia (as N) Total suspended solids	0.000 0.000 0.000 0.000 0.000	0.000 0.000 0.000 0.000 0.000	
pH	(')	(')	
Within the range of 7.5 to 10.	somit lie to f		

§ 421.265 Pretreatment standards for existing sources.

Except as provided in 40 CFR 403.7 and 403.13, any existing source subject to this subpart which introduces pollutants into a publicly owned treatment works must comply with 40 CFR Part 403 and achieve the following pretreatment standards for existing sources. The mass of wastewater pollutants in secondary precious metals process wastewater introduced into a POTW must not exceed the following values:

(a) Furnace Wet Air Pollution Control.

SES FOR THE SECONDARY PRECIOUS METALS

Pollutant or pallutant property	Macmum for any 1 day	Maximum for manaby sverege	
	matata, ina	מערביטון לם מ מערביטון לם מ מבטועל לכוו	
20pper วารการีร (toto!) มาตา มาตากการีร (cs N)	5709 0.009 4.009 619.009	2745 0250 1159 263550	

(b) Raw Material Granulation.

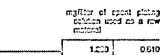
PSES FOR THE SECONDARY PRECIOUS METALS SUBCATEGORY

Pollutant or pollutant proporty	Maximum for cry 1 dry	Maximum ter merbily sverege

		o el pressus la ros en Cio al which is
Copper	0 600	0 000
Cyarute (total)	0 600	0 000
Zine	0.000	0000
Ammon:a (as N)	0 000	0000

(c) Spent Plating Solutions.

PSES FOR THE SECONDARY PRECIOUS METALS SUBCATEGORY



Corpor Cyanido (teto!) Zino Ammon.a (as N)	1 929	0420

(d) Spent Cyanide Stripping Solutions.

PSES FOR THE SECONDARY PRECIOUS METALS SUBCATEGORY

Pollutani er pollutani propeny	Maxmum for any 1 day	Macman for monthly crorege
		io of pressus luced by cys- ng
C:;;;cr	1 403 0,220	

(e) Refinery Wet Air Pollution Control.

PSES FOR THE SECONDARY PRECIOUS METALS SUBCATEGORY

Polisant or polisiant property	Maurum Iorary 1 day	Maximum for monthly average
		e of precious ducing silver, inclinery
Dc;;;cr	1.220	0.610
Cyardo ('s'::')	0.200 (	050.0
Zno	1.020	0.420
Аллела (ез 17)	133.300	58.600

(f) Gold Solvent Extraction Raffinate and Wash Water.

PSES FOR THE SECONDARY PRECIOUS METALS SUBCATEGORY

Pellulant er pallulant preperty	Maximum for any 1 day	Maximum for monthly average
		ice of gold ry solvent ex- cess
Соррет. Суалобо (toto)	0.806 0.126 0.643 84.070	0.334 0.051 0.265 38.830

# (g) Gold Spent Electrolyte.

PSES FOR THE SECONDARY PRECIOUS METALS SUBCATEGORY

Pellidani or pallidani property	Maximum far any 1 day	Maximum for mentity average
	mg/bay eur preduced t refining	ica of gold ny electrolytic
Сэррст Суданда (саха) Zina Алалааса (са N)	0.011 0.002 0.009 1.160	0.005 0.001 0.004 0.510

(h) Gold Precipitation and Filtration.

PSES FOR THE SECONDARY PRECIOUS METALS
SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/troy ounce of gold precipitated	
Copper	5.632	2.684
Cyanido (total)	0.880	0.352
Zinc	4.488	1.848
L.I. IV		

(i) Platinum Precipitation and Filtration.

#### PSES FOR THE SECONDARY PRECIOUS METALS SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average

by ounce of platinum precipitated Copper..... Cyanide (total)... 8 656 3.172 1.040 0.416 Zinc, 5.304 2.184 Ammonia (as N)..... 693.900 304.500

#### (j) Palladium Precipitation and Filtration.

#### PSES FOR THE SECONDARY PRECIOUS METALS SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/troy	ounce of

Copper	palladium precipitated	
	4.480	2.135
Cyanide (total)	0.700	0.280
Zinc	3.570	1.470
Ammonia (as N)	467.000	205.000

#### (k) Other Platinum Group Metals Precipitation and Filtration.

#### PSES FOR THE SECONDARY PRECIOUS METALS SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/troy ounce of o platinum group ma precipitated	
	preuprateu	
Copper	6.656	3.172
Copper Cyanide (total)		
Coppor Cyanide (lotal) Zinc	6.656	3.172

(1) Spent Solutions from PGC Salt Production.

PSES FOR THE SECONDARY PRECIOUS METALS
SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/troy ounce of gold contained in PGC product	
Соррег	1.152	0.549
Cyanide (total)	0.180	0.072
Zinc	0.918	0.378
Ammonia (as N)	120.100	52,700

#### (m) Equipment and Floor Wash.

PSES FOR THE SECONDARY PRECIOUS METALS SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
		e of precious sluding silver, refinery

Copper..... Cyanide (total). 0.000 0.000 0.000 0.000 0.000 Ammonia (as N). 0.000 0.000

§ 421.266 Pretreatment standards for new sources.

Except as provided in 40 CFR 403.7, any new source subject to this subpart which introduces pollutants into a publicly owned treatment works must comply with 40 CFR Part 403 and achieve the following pretreatment standards for new sources. The mass of wastewater pollutants in secondary precious metals process wastewater introduced into a POTW shall not exceed the following values:

(a) Furnace Wet Air Pollution Control.

PSNS FOR THE SECONDARY PRECIOUS METALS SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/troy ounce of precio metals, mcluding situ routed through fumace	
Соррег		
Cyanide (total)	routed thro	ugh fumace
Copper Cyanide (total) Zinc	routed thro	ugh furnace 0.000

# (b) Raw Material Granulation.

PSNS FOR THE SECONDARY PRECIOUS METALS SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/troy ounce of precious metals contained in the raw material which is granulated	
Copper	0.000	0.000
Cyanide (total)	0.000	0.000
Zinc	0.000	0.000

#### PSNS FOR THE SECONDARY PRECIOUS METALS SUBCATEGORY-Continued

Pollutant or pollutant proporty	Maximum for any 1 day	Maximum for monthly average
Ammonia (as N)	0.000	0.000

#### (c) Spent Plating Solutions.

#### PSNS FOR THE SECONDARY PRECIOUS METALS SUBCATEGORY

		•
Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly averago
		spont plating ied as a raw
<b>2</b>		

Copper	1.280	0.610
Cyanide (total)	0.200	0300
Zinc		0,420
Ammonia (as N)	133.300	60.600

# (d) Spent Cyanide Stripping Solutions.

#### PSNS FOR THE SECONDARY PRECIOUS METALS SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly averago
	mg/troy ounce of procleus metals produced by cya- nide stripping	
Copper	1.408	0 071

#### (e) Refinery Wet Air Pollution Control.

#### PSNS FOR THE SECONDARY PRECIOUS METALS SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/troy ounco of precious motals, including silver, produced in refinery	
Copper Cyanide (total) Zinc Ammonia (as N)	1.260 0.200 1.020 133.300	0.010 0.080 0.420 58.600

#### (f) Gold Solvent Extraction Raffinate and Wash Water.

#### PSNS FOR THE SECONDARY PRECIOUS METALS SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day mg/troy ounco of gel produced by solvant or traction process	
Copper Cyanide (total)	0.806 0,126	0.384 0.051
Zinc	0.643 84.070	0.265

#### (g) Gold Spent Electrolyte.

# PSNS FOR THE SECONDARY PRECIOUS METALS

SUBCATE	GOAT	
Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/troy our produced t refining	ico of gold ny electrolytic
Copper Cyanide (total) Zinc Ammon:a (as N)	0.011 0.002 0.009 1.160	0.005 0.001 0.004 0.510

## (h) Gold Precipitation and Filtration.

# PSNS FOR THE SECONDARY PRECIOUS METALS SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/troy ou precs	nce of gold

Copper	5.632	2.684
Cyanide (total)	0.880	0.352
Zinc	4.488	1.849
Ammonia (as N)	583.800	257.700
	1	

#### (i) Platinum Precipitation and Filtration.

#### PSNS FOR THE SECONDARY PRECIOUS METALS SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/troy ounce of platinum precipitated	

(j) Palladium Precipitation and	
Filtration.	

Zinc

Ammonia (as N)

PSNS FOR THE SECONDARY PRECIOUS METALS SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average

mg/troy ounce of palladium precipitated

5.304

693.900

2.184

304,500

Copper	4.480	2.135
Cyar.de (total)	0.700	0.280
Zinc	3.570	1.470
Armonua (as N) 4	67.000	205.000

(k) Other Platinum Group Metals Precipitation and Filtration.

#### PSNS FOR THE SECONDARY PRECIOUS METALS SUBCATEGORY

Pollutant or pollutant property	Maximum far cry 1 day	Maximum for monoby everage
Lighted array of again tighted array of again		
Соррорг Суатээ (toto). Zino Алтога (as N)	0 613 1 049 5 2 94 6 3 3 2 1 3	3 172 0 416 2 184 0 2 184

#### (1) Spent Solutions from PGC Salt Production.

# PSNS FOR THE SECONDARY PRECIOUS METALS SUBCATEGORY

Pollutant or pollutant property	Maximum fer eny 1 doy	Moximum tax monthly average	
_	m3/livy curro cl gild contained in FBO predict		
Соррот. Сулато (tota)	1 152 0 183 0 918 129 169	0543 0972 0373 52763	

#### (m) Equipment and Floor Wash.

#### PSNS FOR THE SECONDARY PRECIDUS METALS SUBCATEGORY

Pollutant or pallutant proporty	Maxmum for cny 1 doy	איניבראיים ג'בי ערבייביא פעריביביא
	·	

		n el prezens inting cher, refinery
Copper	0000 0000 0000 0000	0 000 0 000 0 000 0 000
Zinc	0000	0 000

#### §421.267 [Reserved]

Subpart AA—Primary Rare Earth Metals Subcategory

§ 421.270 Applicability: Description of the primary rare earth metals subcategory.

The provisions of this subpart are applicable to discharges resulting from the production of rare earth metals and mischmetal by primary rare earth metals facilities processing rare earth metal oxides, chlorides, and fluorides.

#### § 421.271 Specialized definitions.

In addition to what 1s provided below: (a) The general definitions,

abbreviations, and methods of analysis set forth in 40 CFR Part 401 shall apply to this subpart.

(b) The term "rare earth metals" refers to the elements scandium, yttruum, and lanthanum to lutetium, inclusive.

(c) The term "mischmetal" refers to a rare earth metal alloy comprised of the natural mixture of rare earths to about 94-99 percent. The balance of the alloy includes traces of other elements and one to two percent iron.

§ 421.272 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available.

Except as provided in 40 CFR 125.39 through 125.32, any existing point source subject to this subpart shall achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable technology currently available:

(a) Dehydration Furnace Quench and Wet Air Pollution Control,

#### BPT LIMITATIONS FOR THE PRIMARY RARE EARTH METALS SUBCATEGORY

Pellitant er pellitant preperty	Махлит for алу 1 day	Maximum for monthly average
	mg/kg (poundo per milio poundo) of mochemeta produced from wet ren contractiondes	
האברה (נוצב)	6.512	2.684
Lcod	6.216	2.980
Lead 1Kchel	6.216 23.420	2.560 18.800
Lcod	6.216	2.980

Within the range of 7.5 to 10.0 at all times.

(b) Electrolytic Reduction Cell Quench.

#### BPT LIMITATIONS FOR THE PRIMARY RARE EARTH METALS SUBCATEGORY

Pellutant or pollutant property	Maximum for any 1 day	for	lacman r menthly average
	mg/kg (pounds per million pounds) of mischinetal produced		
Otremum (total)	7.216		2.952 3.220
Notel	31.450		20.830
Total suspended selids	672,400	ĺ	319.000
£H	9		(*)

Within the range of 7.5 to 10.0 at all times.

(c) Electrolytic Reduction Cell Wet Aur Pollution Control.

#### BPT LIMITATIONS FOR THE PRIMARY RARE EARTH METALS SUBCATEGORY

Fellinant or pollutant property	Maximum for any 1 day	Maxmum for monthly averaga
		do per millen 1. miochmetal
כלעכודינטיו (נוצב)	0.000	600.0
LCC1	653.0	0.000
NE:kcl	0.000	0.000
Total ಮಂತರಾದಂತ ಮಂತತ	0.000	0.00
¢Н	(*)	(1)

\* Within the range of 7.5 to 10.0 at all times.

§ 421.273 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable.

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart shall achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable.

(a) Dehvdration Furnace Quench and Wet Air Pollution Control.

#### BAT LIMITATIONS FOR THE PRIMARY RARE EARTH METALS SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average		
	mg/kg (pounds per millio			

pounds) of mischmetal produced from wet rare earth chlorides

Hexachlorobenzene
-------------------

#### (b) Electrolytic Reduction Cell Ouench.

#### BAT LIMITATIONS FOR THE PRIMARY RARE EARTH METALS SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average	
	mg/kg (pounds per million pounds) of mischmete produced		
	pounds) o		
Hexachlorobenzene	pounds) o		
Chromum (total)	pounds) o produced	f mischmetal	
Hexachlorobqnzene Chromum (Iolal)	pounds) o produced 0.016	f mischmetal	

#### (c) Electrolytic Reduction Cell Wet Air Pollution Control.

#### BAT LIMITATIONS FOR THE PRIMARY RARE EARTH METALS SUBCATEGORY

Maximum for any 1 day	Maximum for monthly average	
mg/kg (pounds per millio pounds) of mischmete produced		
0.000	0.000	
	0.000	
0.000	0.000	
	for any 1 day mg/kg (poun- pounds) o produced 0.000 0.000	

#### § 421.274 Standards of performance for new sources.

Any new source subject to this subpart shall achieve the following new source performance standards:

(a) Dehvdration Furnace Quench and Wet Air Pollution Control.

NSPS FOR THE PRIMARY RARE EARTH METALS SUBCATEGORY

Pollutant or pollutant property

Hevenhloroheozene

Total suspended solids.

Pollutant or pollutant property

Heyechlorohenzene

Total suspended solids.

Air Pollution Control.

Pollutant or pollutant property

Hexachlorohenzene

Total suspended solids...

existing sources.

Chromium (total)

Lead.

oH.

Nickel.

values:

Chromium (total).

Lead.

Nickel

pH...

<sup>1</sup> Within the range of 7.5 to 10.0 at all times.

<sup>1</sup> Within the range of 7.5 to 10.0 at all times.

Within the range of 7.5 to 10.0 at all times.

to this subpart which introduces

pollutants into a publicly owned

§ 421.275 Pretreatment standards for

Except as provided in 40 CFR 403.7

and 403.13, any existing source subject

treatment works must comply with 40

pretreatment standards for existing

sources. The mass of wastewater

CFR Part 403 and achieve the following

pollutants in primary rare earth metals process wastewater introduced into a

POTW must not exceed the following

(c) Electrolytic Reduction Cell Wet

NSPS FOR THE PRIMARY RARE EARTH METALS

SUBCATEGORY

(b) Electrolytic Reduction Cell

NSPS FOR THE PRIMARY RARE EARTH METALS

SUBCATEGORY

Chromum (total)

hea1

Nicke

DH.

Quench.

22.200

Maximum for any 1 day

(2)

17.760

Maximum for monthly average

0.016

0.246

0.213 0.607

19.680

Maximum for monthly average

0.000

0.000

0.000

0.000

(7)

(1)

mg/kg (pounds per million

0.016

0.607

0.459

24,600

Maximum for any 1 day

mg/kg (pounds per million pounds) of mischmetal produced

0 000

0.000

0.000

0.000

n

(1)

pounds) of mischmetal produced

(1)

Nickel.

(a) Dehydration Furnace Quench and Wet Air Pollution Control.

PSES FOR THE PRIMARY RARE EARTH METALS SUBCATEGORY

Maximum for any 1 day	Maximum for monthly average	Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
pounds) o	ds per million f mischmetal from wet rare ides		pounds) o	ds per million f mischmotal rom wet rare des
0.015 0.548 0.414 0.814	0.015 0.222 0.192 0.548	Hexachlorobenzeno Chrom:um (total) Lead	0.015 0.548 0.414	0.015 0.222 0.192

#### (b) Electrolytic Reduction Cell Ouench.

#### PSES FOR THE PRIMARY RARE EARTH METALS SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average

ma/ka (pounds per million pounds) of mischmetal produced

0.814

0.548

Hexachlorobenzene	0.016	0.010
Chromium (total)	0.607	0.240
Load	0.459	0.213
Nickel	0.902	0.607

#### (c) Electrolytic Reduction Cell Wet Air Pollution Control.

#### PSES FOR THE PRIMARY RARE EARTH METALS SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
		də per millen 1 mischmetal
Hexachlorobenzene	0.000	0.000

Chromum (total) 0.000 0.000 0.000 Lead. 0.000 Nickel. 0.000 0.000

§ 421.276 Pretreatment standards for new sources.

Except as provided in 40 CFR 403.7. any new source subject to this subpart which introduces pollutants into a publicly owned treatment works must comply with 40 CFR Part 403 and achieve the following pretreatment standards for new sources. The mass of wastewater pollutants in primary rare earth metals process wastewater introduced into a POTW shall not exceed the following values:

(a) Dehydration Furnace Quench and Wet Air Pollution Control.

# 26448

# PSNS FOR THE PRIMARY RARE EARTH METALS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly averago
<b></b>		f mischmetal rom wat raro
Hexach'orobenzene Chromum (total) Lead Nickel	0.015 0.548 0.414 0.814	0.015 0.222 0.192 0.543

# (b) Electrolytic Reduction Cell Quench.

#### PSNS FOR THE PRIMARY RARE EARTH METALS SUBCATEGORY

Pollutant or pollutant property	Maxemum for any 1 day	Maximum for menticly average
-		ds per millen f mischmetal
Hexachlorobenzene Chromum (total) Lead Nickel.	0.018 0.607 0.459 0.802	0.018 0.248 0.213 0.607

# (c) Electrolytic Reduction Cell Wet Aır Pollution Control.

#### PSNS FOR THE PRIMARY RARE EARTH METALS SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for montily overage
	mg/kg (poun pounds) o produced	ds per million I mischmetal
Raxach'orobenzene Chromum (total) Lead Nicket	0.000 0.000 0.000 -0.000	0.000 0.000 0.000 0.000

# §421.277 [Reserved]

- Subpart AB—Secondary Tantalum Subcategory
- § 421.280 Applicability: Description of the secondary tantaium subcategory.

The provisions of this subpart are applicable to discharges resulting from the production of tantalum at secondary tantalum facilities.

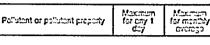
§ 421.281 Specialized definitions.

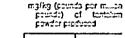
For the purpose of this subpart the general definitions, abbreviations, and methods of analysis set forth in 40 CFR Part 401 shall apply to this subpart.

§ 421.282 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available. Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart shall achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable technology currently available:

# (a) Tantalum Alloy Leach and Rinse.

BPT LIMITATIONS FOR THE SECONDARY TANTALUM SUBCATEGORY





	433229	20000
	C2363	49 129
	442,600	292.999
	309700	149763
cponded polida	9,455 009	4,407.000
	0	(1)

\* Within the range of 7.5 to 100 at all times.

Copper.

Lead N.skcl.... Zino...... Total cur nH

# (b) Capacitor Leach and Rinse.

#### BPT LIMITATIONS FOR THE SECONDARY TANTALUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Moximum for menoloy averago
	(ctracq	do per milion ef textelum coucod frem
Copper	33.320 8.434	20.200 4.040
Nexel	33769	25623
Zing	20 499	12.300
Total suspended set is	803.203	\$33,955
-u	( e)	i /n

\* Within the range of 7.5 to 100 ct cll times.

# (c) Tantalum Sludge Leach and Rinse.

#### BPT LIMITATIONS FOR THE SECONDARY TANTALUM SUBCATEGORY

Pollutant or pollutant property	Maximum for city 1 day	אבאלאבא ובי שניעני פיניטאע געניגע
	mg/kg (pound poundo) ( powdor pro	of testation
Copper	\$30.100	285.833
	E9.230	41 000
Lead	6.246.25	
Netel	334200	209803
N.ckel	334,200	209809

(d) Tantalum Powder Acıd Wash and Rinse.

#### BPT LIMITATIONS FOR THE SECONDARY TANTALUM SUBCATEGORY

Polisiant or prilident property	Maximum for any 1 day	form	trum tentity 2033
	mg/kg (coun poundo) powder pro	ol t	antafum
C:;;;:r	0.623	1	0.350
Lord	0.147		0.070
Netch	0.672	1	0.445
Zas	0.511		0.214
Total succended solids	14.350		6.225
£H	(*)		(')

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

# (e) Leaching Wet Air Pollution Control.

#### BPT LIMITATIONS FOR THE SECONDARY TANTALUM SUBCATEGORY

Pallytant or pallytant property	Maximum for any 1 day	Maximum for monthly average
-	pounds) o	ds per millen A equivitient Lum powder
C:ppcr	9.272 2.050	4.830 0.976
Nistol Zno Total succented series	9.370 7.125 200.100	6.193 2.977 95.160
¢H	(1)	(1)

Within the range of 7.5 to 10.0 at all times.

§ 421.233 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable.

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

# (a) Tantalum Alloy Leach and Rinse.

BAT LIMITATIONS FOR THE SECONDARY TANTALUM SUBCATEGORY

Pellytant or pallytant property	Maximum Icr any 1 day	Maxmum for monthly average
	mg/kg (peuno	is per millen of- tartzium
	pewder pro	
Circor		duced F
C:ppcr	pewdor pro	
	pewdar pro 235.200	duced 149,760

(b) Capacitor Leach and Rinse.

#### BAT LIMITATIONS FOR THE SECONDARY **TANTALUM SUBCATEGORY**

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
		ds per million of tantalum oduced from
•	-	

(c) Tantalum Sludge Leach and Rinse.

#### BAT LIMITATIONS FOR THE SECONDARY TANTALUM SUBCATEGORY

Maximum for any 1 day	Maximum for monthly average
pounds) c	ds per million of equivalent slum powder
262.800	125.300
	26.690 75.960
209.400	86.230
	for any 1 day mg/kg (poun pounds) o pure tants produced 262.800 57.490 112.900

(d) Tantalum Powder Acid Wash and Rinse.

#### BAT LIMITATIONS FOR THE SECONDARY TANTALUM SUBCATEGORY

Pollutant or pollutant property	Maximum fot any 1 day	Maximum for monthly average
	mg/kg (poun pounds) powder pro	of tantalum
Copper	0.448	0.214

(e) Leaching Wet Air Pollution Control.

#### BAT LIMITATIONS FOR THE SECONDARY TANTALUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
		ds per million of equivalent
		um powder
Copper	pure tanta produced	
Copper	pure tanta produced	uum powder
	pure tanta produced 6.247	Jum powder 2.977

#### § 421.284 Standards of performance for new sources.

Any new source subject to this subpart shall achieve the following new source performance standards:

(a) *Tantalum Alloy Leach and Rinse*.

#### NSPS FOR THE SECONDARY TANTALUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (poun pounds) powder pro	of tantalum
Copper	295.200	140.700
Lead	64.570	29.980
Nickel	126.900	85.320
Zinc	235.200	96.850
Total suspended solids	3,459.000	2,767.000
pH	(*)	(4)

<sup>1</sup> Within the range of 7.5 to 10.0 at all times.

# (b) Capacitor Leach and Rinse.

#### NSPS FOR THE SECONDARY TANTALUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
		ds per million of tantalum oduced from
Copper	25,860	12.320
Lead	5.656	2.526
Nickel	11.110	7.474
Zinc	20.610	8.484
Total suspended solids	303.000	242.400

\* Within the range of 7.5 to 10.0 at all times.

# (c) Tantalum Sludge Leach and Rinse.

#### NSPS FOR THE SECONDARY TANTALUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
		ds per million I equivalent Ilum powder
Copper Lead Nickel Zinc Total suspended solids	262.800 57.490 112.900 209.400 3.080.000	125.300 26.690 75.£60 86.230 2.464.000
PH	(!)	(1)

(d) Tantalum Powder Acid Wash and Rinse.

NSPS FOR THE SECONDARY TANTALUM	
SUBCATEGORY	

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (poun pounds) powder pro	of tantalum
_		

Copper	0.448	0.214
Lead	0.098	0.046
Nicket	0.193	0.130
Zinc	0.357	0.147
Total suspended solids	5.250	4.200
pH	(*)	(1)

<sup>1</sup> Within the range of 7.5 to 10.0 at all times.

#### (e) Leaching Wet Air Pollution Control.

#### NSPS FOR THE SECONDARY TANTALUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
		da per million of equivalent dum powder
Copper	6.247 1.367	2.977 0.634
Nickel	2.684	1.603
Zinc	4.978	2.050
Total suspended solids	73.200	59.560
pH	(*)	(*)

<sup>1</sup> Within the range of 7.5 to 10.0 at all times.

#### § 412.285 [Reserved]

§ 421.286 Pretreatment standards for new sources.

Except as provided in 40 CFR 403.7, any new source subject to this subpart which introduces pollutants into a publicly owned treatment works must comply with 40 CFR Part 403 and achieve the following pretreatment standards for new sources. The mass of wastewater pollutants in secondary tantalum process wastewater introduced into a POTW shall not exceed the following values:

(a) Tantalum Alloy Leach and Rinse.

#### PSNS FOR THE SECONDARY TANTALUM SUBCATEGORY

Pollutant or pollutant property	Maxlumum for any 1 day	Maximum for monthly average
	mg/kg (poun	da per million of tantalum
	powder pro	
Copper	powder pro 295.200	duced 140,700
Lead	295.200 64.570	duced 140,700 29,980
	powder pro 295.200	duced 140,700

## (b) Capacitor Leach and Rinse.

#### PSNS FOR THE SECONDARY TANTALUM SUBCATEGORY

Pollutant or pollutant property	Maxiumum for any 1 day	Maximum for monthly averago
	(chnuoq	ds por million of tantalum
	leaching	oduced from
Copper	leaching 25.860	12.320
Copper	leaching 25.860	<u>,</u>

(c) Tantalum Sludge Leach and Rinse.

#### PSNS FOR THE SECONDARY TANTALUM SUBCATEGORY

Pollutant or pollutant property	Maxumum for any 1 day	Maximum for monthly average
	mg/kg (poun	ds per millon
		of equivalent slum powder
Copper	pure tanta	
Copper	pure tants produced	zium powdei
	pure tents produced 262.800	20m powder 125.300

(d) Tantalum Powder Acid Wash and Rinse.

#### PSNS FOR THE SECONDARY TANTALUM SUBCATEGORY

Pollutant or pollutant property	Maxumum for any 1 day	Maximum for monthly average
	mg/kg (poun pounds) powder pro	of tantaler
Copper Lead Nickel	0.448 0.093 0.193	0.214 0.046 0.130
Zinc	0.357	0.147

## (e) Leaching Wet Air Pollution Control.

#### ' PSNS FOR THE SECONDARY TANTALUM SUBCATEGORY

Pollutant or pollutant property	Maxumum for any 1 day	Maximum for monthly average
	mg/kg (pounds per million pounds) of equivalent pure tantalum powder produced	
	pounds) c pure tanta	of equivalent
Copper	pounds) c pure tanta	of equivalent
Copper	pounds) o pure tanta produced	of equivalent
	pounds) o pure tanta produced 6.247	of equivalent Lum powder 2.977

## § 421.287 [Reserved]

#### Subpart AC-Primary and Secondary Tin Subcategory

# § 421.290 Applicability: Description of the primary and secondary tin subcategory.

The provisions of this subpart are applicable to discharges resulting from the production of tin at primary and secondary tin facilities.

## § 421.291 Specialized definitions.

For the purpose of this subpart the general definitions, abbreviations, and methods of analysis set forth in 40 CFR Part 401 shall apply to this subpart.

§ 421.292 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available.

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

#### BPT LIMITATIONS FOR THE PRIMARY AND SECONDARY TIN SUBCATEGORY

Pollutant or pollutant property	Maxamum for ony 1 doy	Maximum for monthly avoidgo
		is per milita La metal pro-
Ant.mony Lead N.ckcl	62153 0102 41610 6225 1,63203 753503 109673 623503 (4)	27743 4334 27553 2651 1,65769 433453 43763 43763 432659 (4)

# \* Within the range of 7.5 to 100 at all times.

# (b) Dealuminizing Rinse.

#### BPT LIMITATIONS FOR THE PRIMARY AND SECONDARY TIN SUBCATEGORY

Pollutan or pollutant property	Maximum for any 1 day	Maximum for menoly average
		is per milien beskministed reed
Antmony.	0.101	0 045
Lead	0015	0 007
N.ckcl	0.057	00:44
Cyanida (lota)	0 0 10	0024
Ammon:a (as N)	4 670	2059
Fluendo	1.225	0760
Tin	0 172	0 071
Total suspended set do	1 435	063
oH	1 er	- en

# "Within the range of 7.5 to 100 at all times

# (c) Tin Hydroxude Wash.

#### BPT LIMITATIONS FOR THE PRIMARY AND SECONDARY TIN SUBCATEGORY

Pollutant or pollutant property	Maximum for ony 1 day	Maximum for monthly evenego
	mg/kg (prum prumds) el weshed	is per m∷sr La hydeusi
Antmony	34.310	1533
Lcad	5,020	2531
N.skcl	22.810	15 163
Cyarido (leta')	3497	1439
Ammenta (as N)	1,535 000	700 000
Fluonto	418 400	233 103
Tin	53.810	24 150
Total suspended set is	400 100	233 103
рН	(4)	(4)

#### \* Within the range of 7.5 to 10.0 at all Lines.

# (d) Spent Electrowinning Solution from New Scrap.

#### BPT LIMITATIONS FOR THE PRIMARY AND SECONDARY TIN SUBCATEGORY

Pellutant er pallutant proporty	Maximum for any 1 day	Maximum for monthly average
	mg/kg (pound poundo) o th produced	f electrolytic
Antmony.	43.220	21.510
Local	7.058	3.380
11.24C1	32,260	21.340
Cyan 10 (1012)	4.872	2016
Annana (03 N)	2,242,000	983.800
Flatingo	523.000	336.000
Тл	82.660	33.940
Tetal suspended salida	£33.800	327.600
рН	e)	(9)

\*Within the range of 7.5 to 10.0 at all times.

#### (e) Spent Electrowinning Solution from Municipal Solid Waste.

#### BPT LIMITATIONS FOR THE PRIMARY AND SECONDARY TIN SUBCATEGORY

Pellutant or pellutant property	Maximum for any 1 day	Maxmum for monthly average
	Founda) of	do per millen dealuminized processed
Animony Lood Nickol Cyanida (tala) Armana (talki) Futuria Futuria Tala perpended colida FM	0.342 0050 0.223 0.035 15.230 4.165 0.525 4.879 (*)	0.152 0.024 0.151 0.014 6.970 2.330 0.240 2.321 ( <sup>1</sup> )

Within the range of 7.5 to 10.0 at all times.

#### (f) Tin Mud Acid Neutralization Filtrate.

#### BPT LIMITATIONS FOR THE PRIMARY AND SECONDARY TIN SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for mensiby average
	malka (cours	is for millen

perinds) of	neutroizeo
dewatered to	n mud pro
duced	•

Animany	14,430	6.450
Loca	2.120	1.010
N. #01	9.630	6.410
C/2:22)	1.454	0.606
ATTE (23 10)	673.500	295.600
Fightio	176.700	101.000
To	24.830	10.200
Tetal surgested solids	208.900	93.420
£X	6)	(*)

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

#### (g) Tin Hydroxide Supernatant from Scrap.

#### BPT LIMITATIONS FOR THE PRIMARY AND SECONDARY TIN SUBCATEGORY

26452

Pollulant or pollulant property	Maximum for any 1 day	Maximum for monthly average
		ds per million tin metal pro-
Antimony	159.700 23.370	71.220 11.130
Nickel Cyanide (total) Ammonia (as N)	106.800 16.140 7.427.000	70.660 6.677 3.259.000
Fluorido	1,948.000 273.800	1,113.000 112.400
Total suspended solids	2,281.000 ( <sup>1</sup> )	1,085.000 (²)

<sup>1</sup> Within the range of 7.5 to 10.0 at all times.

(h) Tin Hydroxıde Supernatant from Spent Plating Solutions.

#### BPT LIMITATIONS FOR THE PRIMARY AND SECONDARY TIN SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (poun pounds) of duced	ds per million tin metal pro-
Antimony	109.000	48.610
Lead	15.950	7.596
Nickel	72.920	48.230
Cyanide (total)	11.020	4.558
Ammonia (as N)	5,067.000	2,223.000
Fluonde	1,329.000	759.600
Tin	186.900	76.720
Total suspended solids	1,557.000	740.600
pH	e) ()	e (*)

<sup>3</sup> Within the range of 7.5 to 10.0 at all times

(i) *Tin Hydroxıde Supernatant from Sludge Solids.* 

#### BPT LIMITATIONS FOR THE PRIMARY AND SECONDARY TIN SUBCATEGORY

Pollutant or pollutant property	Maxamum for any 1 day	Maximum for monthly average
	mg/kg (poun pounds) of duced	ds per million tin metal pro-
Antimony	477.500	213.000
Lead	69.870	33.270
Nicket	319.400	211.300
Cyanide (total)	48.250	19.970
Ammonia (as N)	22,200.000	9,743.000
Fluoride	5,823.000	3,327.000
Tin	818.500	336.100
Total suspended solids	6,821.000	3,244.000
рН	(1)	(•)
<sup>1</sup> Within the range of 7.5 to 10.	0 at all times.	·····
(j) Tin Hydroxıde Fi	iltrate.	
BPT LIMITATIONS FOR SECONDARY TIN S		
	· · · · · · · · · · · · · · · · · · ·	<b>.</b>

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (poun pounds) of duced	ds per million tin metal pro-
Antimony	71.880 10.520	32.060 5.009

#### BPT LIMITATIONS FOR THE PRIMARY AND SECONDARY TIN SUBCATEGORY—Continued

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly everage
Nickel	48.090	31.810
Cyanide (total)	7.263	3.005
Ammonia (as N)	3,342.000	1,467,000
Fluorida	876.600	500,900
Tin	123.200	50.590
Total suspended solids	1,027.000	488,400
pH	(1)	(1)

<sup>1</sup> Within the range of 7.5 to 10.0 at all times.

§ 421.293 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable.

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

(a) Smelter Scrubber.

BAT LIMITATIONS FOR THE PRIMARY AND SECONDARY TIN SUBCATEGORY

Poilutant or poliutant property	Maximum for any 1 day	Maximum for monthly average

	mg/kg (pounds per millio pounds) of tin metal pro duced			
Antimony	41.830	18.640		
Lead	6.068	2.817		
Nickel	* 11.920	8.018		
Cyanide (total)	4.334	1.734		
Ammonia (as N)	2,892.000	1.269.000		
Fluoride	758,500	433,400		
Tin	71.420	29.330		

# (b) Dealuminizing Rinse.

BAT LIMITATIONS FOR THE PRIMARY AND SECONDARY TIN SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average	
	mg/kg (pound pounds) of scrap produ	dealuminized	
Antimony	0.068	0.030	
Lead	0.010	0.005	
Nickel	0.019	0.013	
Cyanide (total)	0.007	0.003	
Ammonia (as N)	4.670	2.050	
Fluoride	1.225	0.700	
Tin	0.120	0.050	

# (c) Tin Hydroxide Wash.

#### BAT LIMITATIONS FOR THE PRIMARY AND SECONDARY TIN SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 " day	Maximum for monthly average	
	mg/kg (poun pounds) of washed	da por million tin hydroxida	
Antimony	23.070	10 280	
Lead	3.347	1.554	
Nickel	6.574	4:423	
Cyanide (total)	2.391	0 957	
Ammonia (as N)	1,595.000	700 000	
Fluorido	418,400	239.100	
Tin	39,400	10.180	

# (d) Spent Electrowinning Solution from New Scrap.

#### BAT LIMITATIONS FOR THE PRIMARY AND SECONDARY TIN SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (poun pounds) o tin produce	t electrolytic
Antimony Lead Nicket Cyaride (tota) Ammonia (as N) Fluoride Tin	32.430 4.704 9.240 3.360 2,242.000 558.000 55.380	14,450 2,184 0,210 1,344 983,600 336,000 22,740

# (e) Spent Electrowinning Solution from Municipal Solid Waste.

#### BAT LIMITATIONS FOR THE PRIMARY AND SECONDARY TIN SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly averago
	pounds) of	da por million doaluminized processed
Antimony	0.230	0.102
Lead	0.033	0.015
Nickel	0.065	0.044
Cyanide (total)	0.024	0.009
Ammonia (as N)	15.880	0.970

4.165

2 380

## (f) *Tin Mud Acıd Neutralization Filtrate*.

Fluoride ...

#### BAT LIMITATIONS FOR THE PRIMARY AND SECONDARY TIN SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
		ds per million t neutralized tin mud pro-
Antimony	9.741	4.341
Lead	1.413	0.650
Nickel	2.778	1.860
Cyanide (total)	1.010	0,404
Ammonia (as N)	673.500	295.600
Fluoride	176,700	101.000
71-	16.640	0.830

(g) Tin Hydroxıde S								
Scrap.	Supernatai	nt from	BAT LIMITATIONS FOR SECONDARY TIN SUBCA			NSPS FOR THE PRIMARY Suzcategory	AND SECO: Continued	idary Tey J
BAT LIMITATIONS FOR SECONDARY TIN			Pellutant or pallutant property	Maximum far any 1 day	אייישטער איישטער איישט געריגער איישטער	Feliziari er paliziari proporty	Martum for cry 1 cry	for mentity everage
Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly averago	T.a	E2.540	63000	<u> 58</u>	(י)	(')
<u> </u>	·					Without the marga of 7.5 to 10		
		ido per millen En metal pro-	§ 421.294 Standards o new sources.			(d) Spant Electrown from New Scrap.	nning Solu	ition
Antimony Lead Nickel Cyanide (total)	107.400 15.580 30.600 11.130	47.850 7.233 20.550 4.451	Any new source sul subpart shall achieve source performance s (a) Smelter Scrubbe	the follow tandards:		NSPS FOR THE PRIMARY Subcate		IDARY TO
Ammonta (as N) Fluoride Tín	. 7,427.000 . 1,948.000 . 183.500	3,259 000 1,113.000 75.310	NSPS FOR THE PRIMARY	AND SECO	idary Tin	Pellidari er pellidari proparty	Maximum for any 1 day	Macrium for monthly average
(h) Tin Hydroxıde S Spent Plating Solution	Supernatai ns.	nt from	Pollutant or pollutant preparty	Hormon fer cry 1	Marintan for manaly			ds per millen f - electrolytic d
BAT LIMITATIONS FOR				- C7	Everege	Attraty	32,430	14,450
SECONDARY TIN S				mgikg (çemi	tà ta u <u>∵</u> m	Kotol	4,7ē4 9,243	2.184 6.216
	1		Į	೯೦೫ನೆಂ) ಲೆ ರಂಜತೆ	ta matal pro-	Cyanda (tata)	3.389 2.242.009	1.344 \$33.800
Pollutant or pollutant property	for any 1	Maximum for monthly	Ant.meny.	41.000	18 542	Factoria	523.000 55.320	335.000 22,740
	day	Everaga	Lead	60233	2617	Total suspended selling	252.000	201.600
	mg/kg (poun	ds per million	Nickel Oyanida (teta)	11.920	8 018 1.734	<u>рн</u>	(7)	(7)
	pounds) of duced	tin metal pro-	Ammonia (CS Fi)	2012010	1,003000	* William the range of 7.5 to 10.	0 at all times.	
	100060	<del></del>	Fluendo	753550	433439 2383	(e) Spent Electrown	na Salu	tion
Antimony	73.300	\$2.660 	Total suspanded selids	525.100	202.100	from Municipal Solid	Waste.	1011
Nickel	20.630	14.050	рН	(י)	(1)	,		
Oyanide (total) Ammon:a (as N)	7.600	3.039 2.223.000	<sup>4</sup> Within the range of 7.5 to 10.	0 ct c'i t.mca,		NSPS FOR THE PRIMARY	AND SECON	IDARY TIN
Fluoride	1,329.000	759.600	(b) Dealuminizing R	linca		Suecate	GOAY	
Tin	125.200	51.400					Махальт	Maxim
			NSPS FOR THE PRIMARY	AND SECON	IDARY TIN	Pellutani or pollutani property	for any 1	for monthly
(i) Tin Hydroxide Si	upernatan	t from	SUBCATE	GORY			day	8761239
Sludge Solids.			·				mg/kg (pouro	
BAT LIMITATIONS FOR	THE PRIMA	RY AND	Pollutant or pollutant property	Maximum far gry 1	for manady		MSW screp	coolumnzed processed
SECONDARY TIN S	SUBCATEGO	RY		(ت	ອະດາວຽວ	Antartany	0.230	
				mg/kg (peune		Load	02301	0.102
Pollutant or pollutant property	Matemum for any 1	Maximum			ing poor frankers		0.033	0.015
	d3y				declum.nzed	Niskel	0.033 0.065	0.015
	1	for monthly Everage		tarap preda	decharazed ned	Суст. do (total) Аллана (со ti)	0.033 0.065 0.024 15.820	0.015 0.044 0.069 6.970
	ma/ka facuna	for monthly Everage	Ant.mcmy	carca predu C220 0	teotumated teot teot	Сустаа (2012) Алжала (2013) Filianda	0.033 0.025 0.024 15.220 4.165	0.015 0.044 0.03 6.970 2.330
		for monthly Everage	LoadNakol	6220 predu 0 003 0 010 0 019	6000m.nand 201 0 0000 0 0005 0 013	Cycr.do (tota) Armonia (co N) Flictido Tio Tio Total succendod sei do	0.033 0.025 0.024 15.820 4.165 0.330 1.785	0.015 0.044 0.059 6.970 2.330 0.160 1.423
		for monthly average	Lood N stol Ojanido (teto) Ammenia (co N)	0 003 0 003 0 010 0 019 0 007	Conference of rect 0 000 0 005 0 013 0 003	Cyan da (tata) Antoana (as k) Fuanda Tia Teal suspended selida cH	0.033 0.025 0.024 15,220 4.165 0.350 1.785 (*)	0.015 0.044 0.053 6.970 2.330 0.160
Antimony	pounds) of duced 321.100	for monthly Everage ds per millen tin metal pro-	Lead N atcl Oyando (teta) Ammena (cs N). Fluendo	0 003 0 010 0 019 0 037 4 070 1.225	Conferences Confe	Cycr.do (tota) Armonia (co N) Flictido Tio Tio Total succendod sei do	0.033 0.025 0.024 15,220 4.165 0.350 1.785 (*)	0.015 0.044 0.059 6.970 2.330 0.160 1.423
Lead	pounds) of duced	for monthly Everage ds per millen tin matal pro- 143.100 21.630	Lood N stol Ojanido (teto) Ammenia (co N)	0 CC3 0 010 0 019 0 037 4 070	Conference of conference of co	Cycnuts (1918)           Annonia (1918)           Annonia (1918)           Francis           Ton           Ton           Ton           Total suspended colids           FH           * Within the range of 7.5 to 10.	0.033 0.024 15.820 4.165 0.330 1.785 (') 0 at all tares.	0.015 0.044 0.039 6.970 2.330 0.160 1.423 (*)
Lead Nickel Cyanide (total)	poends) of duced 321.100 46.580 91.500 33.260	for monthly <u>cveregg</u> ds per million tin metal pro- 143.100 21.630 61.569 13.310	Lead	0 000 0 000 0 000 0 007 4 070 1.225 0 120	Cochminated coch 0 000 0 000 0 000 0 000 0 000 0 700 0 000	Cyan da (tata) Antoana (as k) Fuanda Tia Teal suspended selida FH	0.033 0.024 15.820 4.165 0.330 1.785 (') 0 at all tares.	0.015 0.044 0.039 6.970 2.330 0.160 1.423 (*)
Lead Nickel Oyanidə (total) Ammorca (as N)	9000005) of duced 321.100 46.580 91.500 33.260 22,200.000 5,623.000	for monthly cverage ds per millon tin metal pro- 143.100 21.630 61.560	Lead. N skol. Qraniso (teta)	0003 0010 0010 0019 007 4070 1.225 0120 0505 ()	Cochminized col 0 600 0 005 0 013 0 003 0 003 0 005 0 005 0 005 0 005 0 0423	Cycn 23 (2013) Armonia (25 K) Francia (25 K) Francia Ton Ton Total supported colida pH Within the range of 7.5 to 100 (1) Tin Mud Acid Ne Fillrate.	0.033 0.024 15.220 4.165 0.235 1.785 (?) 0 at all tracs.	0.015 0.044 0.039 6.970 2.330 0.163 1.423 (*)
Lead Nickel Cyanidə (total) Ammonca (as N)	pomots) of duced 321.100 46.580 91.500 33.260 22,200.000	for monithly <u>Cverage</u> ds per millon tin matal pro- 143.100 21.630 61.560 13.310 9,743.000	Lead N skol Qraniso (teto) Ammana (cs N) Fluendo Tin Total succended colids	6253 preds 0 003 0 000 0 0037 4 070 1 225 0 123 0 123 0 123 0 123 0 123 0 123 0 123 0 123	Cochminized col 0 600 0 005 0 013 0 003 0 003 0 005 0 005 0 005 0 005 0 0423	Cycn 23 (1212) Armonia (1213) Francia (1213) Francia To To To To To To To To To To To To To	0.033 0.024 15.230 4.165 0.333 1.785 (') 0 at all tracs. <i>utralizatio</i> AND SECON	0.015 0.044 0.039 6.970 2.330 0.163 1.423 (*)
Lead Nickel Cyanidə (total) Ammonca (as N)	9000005) of duced 321.100 46.580 91.500 33.260 22,200.000 5,623.000 548.400	for monthly <u>cverage</u> ds per million tin metal pro- 143.100 21.630 61.560 13.310 9,743.000 3,327.000	Lead. N skcl	Excp prefix 0 000 0 000 0 007 4 070 1 225 0 112 0 012 0 055 (1) 0 01 cl traca. Wash.	Contractor Contra	Cycn. 23 (1212) Annorma (1216) From 40 Ton Total supported of colds FH <sup>1</sup> Within the range of 7.5 to 10. (f) Tin Mud Acid Ne Filtrate. NSPS FOR THE PRIMARY SUBCATED	0.033 0.024 15,220 4.165 0.333 1.785 (') 0 at al Lincs, <i>utralizatio</i> AND SECON GORY	0.015 0.044 0.039 6.970 2.320 0.160 1.423 (*) DARY TIN
Lead	perinds) of duced 321.100 46.580 91.570 33.260 22.200.000 5.623.0000 5.623.0000 5.623.0000 5.623.00000000000000000000000000000000000	for monthly cverage ds per milen tin metal pro- 143,100 21,630 61,560 13,310 9,743,000 3,327,000 225,150 RY AND	Lead_ N stol. Cyanido (teta')Armenia (cs N) Fluendo Total surpended celids pH *Withia the ranga of 7.5 to 10 (c) Tin Hydroxide Vi	Excp prefer 0 003 0 010 0 009 0 007 4 070 1 225 0 125 0 125 0 125 0 125 0 125 0 055 0 125 0 055 0 125 0 25 0 25 0 25 0 25 0 25 0 25 0 25 0	Contracts Contracts	Cycn 23 (1212) Armonia (1213) Francia (1213) Francia To To To To To To To To To To To To To	0.033 0.024 15.230 4.165 0.333 1.785 (*) D at all times. <i>outralizatio</i> AND SECON GORY Mocmum for any 1 day	0.015 0.044 0.039 6.970 2.320 0.160 1.423 (*) DARY TIN DARY TIN Maximum for marthy dromage
Lead Nickel Cyaride (total) Ammor:a (as N) Fluoride Tin (j) <i>Tin Hydroxide Fi</i> BAT LIMITATIONS FOR	pomds) of duced 321.100 46.580 91.500 33.260 22.200.000 5.623.000 5.623.000 5.48.400 348.400 THE PRIMAN SUBCATEGOI Maximum for any 1	for monthly cverage ds per milen tin metal pro- 143,100 21,630 61,560 13,310 9,743,000 3,327,000 225,190 RY AND RY Maxmum for monthly	Lead N stol Qanio (teta) Armena (cs N) Fluendo Tin Total surpended cel ds pH <sup>1</sup> Within the range of 7.5 to 10 (c) Tin Hydroxide Vi NSPS FOR THE PRIMARY	Carcy press 0 003 0 010 0 010 0 010 0 037 4 070 1 225 0 125 0 1	Contractor Contra	Cycn. 23 (1212) Annorma (1216) From 40 Ton Total supported of colds FH <sup>1</sup> Within the range of 7.5 to 10. (f) Tin Mud Acid Ne Filtrate. NSPS FOR THE PRIMARY SUBCATED	0.033 0.024 15.220 4.165 0.331 1.785 (7) 0 at all trees. <i>utralizatio</i> AND SECON SORY Mocroum for any 1 day	0.015 0.044 0.039 6.970 2.320 0.160 1.423 (*) DARY TIN DARY TIN Maximum for marthy dromage
Lead Nickel Qyarida (total) Ammona (as N) Fluoride Tin (j) <i>Tin Hydroxide Fi</i> BAT LIMITATIONS FOR SECONDARY TIN S	permids) of duced 321.100 46.580 91.500 33.280 22,200.000 5,823.000 5,823.000 548.400 5,823.000 548.400 5,823.000 548.400 5,823.000 5,833.000 5,933.000 5,833.000 5,833.000 5,833.000 5,833.000 5,833.000 5,833.000 5,833.000 5,833.000 5,833.000 5,833.000 5,833.000 5,833.000 5,833.000 5,833.000 5,833.000 5,833.000 5,833.000 5,833.000 5,833.000 5,933.0000 5,933.0000 5,933.0000 5,933.0000 5,933.00000000000000000000000000000000000	for monthly Everage ds per millen th matal pro- 143.100 21.600 61.560 1.3310 9,743.000 3,327.000 225.190 RY AND RY AND RY Maxmum for monthly Everage	Lead. N skol. Qran.30 (tets). Ammon.a (cs N). Fluends. Tin Total surpended sel.45. pH <sup>1</sup> Within the range of 7.5 to 10 (c) Tin Hydroxide M NSPS FOR THE PRIMARY SUBCATER	Excp pretty 0 (53) 0 010 0 019 0 017 1 (25) 0 123 0 (53) 0 (53) 0 (12) 0	Contractor Contra	Cycnuts (1919) Amoral (1919) Tan Tan Table Stopended colds FM Within the range of 7.5 to 100 (f) Tin Mud Acid Ne Filtrate. NSPS FOR THE PRIMARY SUBCATES Pelivient or pelivient preparty	0.033 0.023 0.024 15,220 4.165 0.333 1.785 (') D at all times. <i>nutralizatio</i> AND SECON GORY Mocmum for any 1 day foundo) of foundo) of directed 9.741	0.015 0.044 0.039 6.970 2.320 0.160 1.423 (*) 0.7 DARY TIN DARY TIN Mountain for monthly average s per million next pro-
Lead Nickel Oyaride (total) Ammona (as N) Fluoride Tin (j) <i>Tin Hydroxide Fi</i> BAT LIMITATIONS FOR SECONDARY TIN S	pomds) of duced 321.100 46.580 91.570 33.260 22.200.000 5.623.0000 5.623.0000 5.623.0000 5.623.0000 5.623.0000 5.623.00000 5.623.0000 5.623.0000000 5.623.00000000000000000000000000000000000	for monthly Everage ds per millen th matal pro- 143.100 21.600 61.560 1.3310 9,743.000 3,327.000 225.190 RY AND RY AND RY Maxmum for monthly Everage	Lead. N skol. Qran.30 (tets). Ammon.a (cs N). Fluends. Tin Total surpended sel.45. pH <sup>1</sup> Within the range of 7.5 to 10 (c) Tin Hydroxide M NSPS FOR THE PRIMARY SUBCATER	Carcy press 0 (C3) 0 (010) 0 (010) 0 (C37 4 (770) 1 (225) 0 (12) 0 (12) 0 (12) 0 (12) 0 (12) 0 (12) 0 (12) 0 (12) (1) 0 (12) 0 (12) (1) 0 (12) 0 (	Contractor Contra	Cycn. 33 (1993) Amorna (1996) Francia Tom Tom Tom Tom Tom Tom Tom Tom	0.033 0.023 0.024 15.233 1.785 (?) 0 at all t.mcs. <i>utralizatio</i> AND SECON SORY Mocrown for any 1 day mg/kg (pound pound) of downland for downland f	0.015 0.044 0.039 6.970 2.320 0.160 1.423 (*) DARY TIN DARY TIN Mov.man for morthly aucress for morthly aucress for mort pro-
Lead Nickel Ovaride (total) Ammona (as N) Fluoride Tin (j) <i>Tin Hydroxide Fi</i> BAT LIMITATIONS FOR SECONDARY TIN S	pomds) of duced 321100 46.580 91.500 33.260 22.200.000 5.523.000 5.523.000 5.48.4000 5.48.4000 5.48.4000 5.48.40000000000000000000000000000000000	for monthly cverage ds per millen tin metal pro- 143,100 21,630 61,560 13,310 9,743,000 3,327,000 225,180 RY AND RY AND RY Maxmum for monthly gverage ds per millen	Lead N skel (c)cn.30 (tete) Ammena (cs N) Fluendo Total surpended set ds pH <sup>1</sup> Within the renge of 7.5 to 10 (c) Tin Hydroxide M NSPS FOR THE PRIMARY SUBCATER Pellutent or pellutent preperty	Earcy press 0 653 0 010 0 019 0 637 4 670 1 225 0 123 0 1	Contracted Contracted Contract Co	Cycnuts (1919) Amoral (1919) Amoral (1919)  Form do a constraint of the range of 7.5 to 100  (f) Tin Mud Acid Nee  Filtrate.  NSPS FOR THE PRIMARY  SUBCATES  Pelivient or politient preparty  Antimony  Lood  (grando (1912)	0.033 0.023 0.024 15,220 4.165 0.353 1.785 (') 0 at all tracs. <i>utralizatio</i> AND SECON GORY Mocrown for any 1 day mg/kg (pound focund) of dayatered twocod 9.741 1.413 2.776 1.010	0.015 0.044 0.039 6.970 2.320 0.160 1.423 (*) 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7
Lead Nickel Oyaride (total) Ammon:a (as N) Fluoride (j) <i>Tin Hydroxide Fi</i> BAT LIMITATIONS FOR SECONDARY TIN S Pollutant or pollutant property	pomds) of duced 321.100 46.580 91.570 33.260 22.200.000 5.623.0000 5.623.0000 5.623.0000 5.623.0000 5.623.0000 5.623.00000 5.623.0000 5.623.0000000 5.623.00000000000000000000000000000000000	for monthly cverage ds per millen tin metal pro- 143,100 21,630 61,560 13,310 9,743,000 3,327,000 225,180 RY AND RY AND RY Maxmum for monthly gverage ds per millen	Lead N stol. Cyania (teta) Armena (cs N) Fluendo Tin Total surpended cell ds pH <sup>1</sup> Within the range of 7.5 to 10 (c) Tin Hydroxide Vi NSPS FOR THE PRIMARY SUBCATED Pollutant or pollutant property	Excp preter 0 (53) 0 010 0 010 0 010 0 010 0 010 1 (25) 0 (25) (1) 0 (25) (1) (1) (2) (2) (2) (2) (2) (2) (2) (2	Contractor Contra	Cycn.do (toto) Amorna (toto) Amorna (toto) Ton Ton Totol surpended colids pH <sup>1</sup> Withor the range of 7.5 to 10. (f) Tin Mud Acid Ne Filtrate. NSPS FOR THE PRIMARY SUBCATES Pellotent or pellotent property Lood Natel Cycendo (toto) Amorna (toto)	0.033 0.023 0.024 15.233 1.785 (') 0 at all tracs. <i>utralizatio</i> AND SECON SORY Mocrosof for any 1 day mg/kg (pound pounds) af doctal founds) af doctal 9.741 1.413 2.776 1.010 673.500	0.015 0.044 0.039 6.970 2.320 0.160 1.423 (*) DARY TIN DARY TIN Mountain for marthly available for for for marthly available for for marthly available for for for for for marthly available for
BAT LIMITATIONS FOR SECONDARY TIN S Pollutant or pollutant property Antimony	permids) of duced 321.100 46.580 91.500 33.280 22,200.000 5,823.000 6,835.000 7,935.000 7,0000 7,0000 7,0000 7,0000 7,0000 7,0000 7,	for monthly Everage ds per millen th matal pro- 143.100 21.600 61.560 13.310 9,743.000 3,327.000 225.190 RY AND RY AND RY Maxmum for monthly Everage ts per millen th metal pro- 21.540 3.2256	Lead. N skel. (yan.id) (teta). Ammena (cs N). Fluendo. Tim. Total surpended sel da. pH. <sup>1</sup> Within the range of 7.5 to 10 (c) Tin Hydroxide Vi NSPS FOR THE PRIMARY SUBCATER Pallutant or pallutant preparty Ant.mony. Lead. Nickel. Oyanica (tota).	Excp prett 0 cc3 0 010 0 019 0 077 4 670 1 225 0 123 0 123 0 123 0 525 (') 0 ct cl traca. Wash. Maxrum fcr cry 1 cry 1 cry 1 cry 1 cry 1 cry 1 cry 1 cry 1 cry 1 cry 2 23 070 3 247 2201	Contracted Contracted Contract Co	Cycn. do (toto) Amorna (toto) Tan Tan Tan Table Depended colids pH Within the range of 7.5 to 100 (f) Tin Mud Acid Ne Filtrate. NSPS FOR THE PRIMARY SUBCATE Pellistant or pellistant preparty Antimenty Lead Pellistant or pellistant preparty Colidation (tot) Amorna (tot N) Filtrate	0.033 0.023 0.024 15,233 1.785 0.333 1.785 (*) 0 at all tracs. <i>utralizatio</i> AND SECON GORY Mocmum for any 1 day focurd) of dayated focurd) of focurd focurd) of focurd focur	0.015 0.044 0.039 6.970 2.320 0.160 1.423 (*) 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7
Lead. Nickel Ovaride (total) Ammorea (as N) Fluoride (j) Tin Hydroxide Fi BAT LIMITATIONS FOR SECONDARY TIN S Pollutant or pollutant property Antimony Lead. Nickel Ovaride (total)	permids) of duced 321.100 46.580 91.500 332.80 22.200.000 5.823.0000 5.823.0000 5.823.00000000000000000000000000000000000	for monthly Everage ds per millen th metal pro- 143.100 21.630 61.560 13.310 9,743.000 3,327.000 225.150 RY AND RY Maxmum for monthly average ds per millon fun metal pro- fun metal pro-	Lead N stol Quantial (teta?) Armenia (cs N) Fluendo The Total surpended cell ds pH <sup>1</sup> Within the range of 7.5 to 10 (c) Tin Hydroxide Vi NSPS FOR THE PRIMARY SUBCATED Pollutant or pollutant property Antimotry	Excp prett 0 (53) 0 010 0 010 0 010 0 010 1 225 0 112 0 555 (') 0 ct cl trrcs. Wash. AND SECON CORY Maxmum for cry 1 cry 1 cry 1 cry 1 cry 2 0 20 070 3 2477 0 574	Contracted Contracted Contract Co	Cycn.do (toto) Amorna (toto) Amorna (toto) Francia Tan Table surpended colids pH <sup>1</sup> Within the range of 7.5 to 10. (i) Tin Mud Acid Ne Filtrate. NSPS FOR THE PRIMARY SUBCATES Pellotent or pellotent property Lood Natel Cyando (toto) Amorna (toto) Francis Tan	0.033 0.023 0.024 15,220 4.165 0.233 1.785 (') 0 at all tracs. <i>utralizatio</i> AND SECON GORY Mocrosoft founds) of droutered t droutered t d	0.015 0.044 0.039 6.970 2.320 0.160 1.423 (*) DARY TIN DARY TIN Mountain for marthly available for
Lead. Nickel. Cyanide (total). Ammon:a (as N). Fluoride	permids) of duced 321.100 45.580 91.500 33.260 22,200.000 5.523.000 5.523.000 5.48.400 5.523.000 5.48.400 5.523.0000 5.523.0000 5.523.0000 5.523.0000 5.523.00000 5.523.00000 5.523.000000 5.523.0000000000000000000000000000000000	for monthly Everage ds per millen in matal pro- 143.100 21.600 61.560 13.310 3,327.000 3,327.000 3,327.000 225.190 RY AND RY AND RY Maxmum for monthly Everage ts per millen in metal pro- 21.540 3.2256 9.265 9.265 1.457.003	Lead N stol. Gyando (teta?) Armena (cs N) Fluendo Tin Total surported cells pH <sup>1</sup> Within the range of 7.5 to 10 (c) Tin Hydroxide M NSPS FOR THE PRIMARY SuBCATED Pollutant or pollutant property Antimotry Lead N stol. Gyanifa (cs N) Antimotry Lead Natel. Colorial (cs D) Ammaria (cs N)	Excp preter 0 (53) 0 010 0 010 0 010 0 010 1 (25) 0 (12) 0 (12	Contracted Contracted Contract Co	Cycn. do (toto) Amorna (toto) Tan Tan Tan Table Depended colids pH Within the range of 7.5 to 100 (f) Tin Mud Acid Ne Filtrate. NSPS FOR THE PRIMARY SUBCATE Pellistant or pellistant preparty Antimenty Lead Pellistant or pellistant preparty Colidation (tot) Amorna (tot N) Filtrate	0.033 0.023 0.024 15,233 1.785 (?) 0 at all t.mcs. wtralization SORY Mocrown SORY Mocrown Corrd) at corrd) at corrd) at downlered t dwalered t	0.015 0.044 0.039 6.970 2.320 0.160 1.423 (*) 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7

NSPS FOR THE PRIMARY AND SECONDARY TIN

(g) Tin Hydroxide Supernatant from Scrap.

#### NSPS FOR THE PRIMARY AND SECONDARY TIN SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
		ds per million tin metal pro-
Antimony	107,400	47,850
Lead	15.580	7.233
Nickel	30.600	20,590
Cyanide (total)	11.130	4.451
Ammonia (as N)	7,427.000	3,259.000
Fluoride	1,948.000	1,113.000
Tin	183.500	75.310
Total suspended solids	834.600	667.700
рН	(*)	(1)

\* Within the range of 7.5 to 10.0 at all times.

(h) Tin Hydroxıde Supernatant from Spent Plating Solutions.

#### NSPS FOR THE PRIMARY AND SECONDARY TIN SUBCATEGORY

Pollutant or pollutant property	Maxamum for any 1 day	Maximum for monthly average
	mg/kg (poun pounds) of duced	ds per million tin metal pro-
Antimony	73.300	32.660
Lead	10.640	4.937
Nickel	20.890	14.050
Cyanide (total)	7.600	3.039
Ammonia (as N)	5,067.000	2,223.000
Fluorido	1,329.000	759.600
Tin	125.200	51.400
Total suspended solids	569.700	455.800
pH	(4)	(L) (L)

\* Within the range of 7.5 to 10.0 at all times.

# (i) *Tin Hydroxıde Supernatant from Sludge Solids.*

#### NSPS FOR THE PRIMARY AND SECONDARY TIN SUBCATEGORY

Pollutant or pollutant property-	Maximum for any 1 day	Maximum for monthly average
	mg/kg (poun pounds) of duced	ds per million tin metal pro-
Antimony	321,100	143.100
Lead	46,580	21.630
Nickel	91.500	61.560
Cyanide (total)	33,280	13.310
Ammonia (as N)		9,743.000
Fluoride		3,327.000
Tin	548.400	225.190
Total suspended solids	2,496.000	1,997.000
pH	(1)	(י)

<sup>1</sup> Within the range of 7.5 to 10.0 at all times.

(j) Tin Hydroxıde Filtrate.

	Maxmum	
Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (poun pounds) of duced	ds per millio tin metal pro
Antimony	48.340	21.54
Lead	7.013	3.25
Nickel	13.780	9.26
Cyanida (total)	5.009	2.00
	3,342,000	1,467.00
Ammonia (as N)		600.00
Ammonia (as N) Fluonde		500.90
	876.600	
Fluonde	876.600 82.540	500.90 33.90 300.50

<sup>1</sup> Within the range of 7.5 to 10.0 at all times.

# $\S$ 421.295 Pretreatment standards for existing sources,

Except as provided in 40 CFR 403.7 and 403.13, any existing source subject to this subpart which introduces pollutants into a publicly owned treatment works must comply with 40 CFR Part 403 and achieve the following pretreatment standards for existing sources. The mass of wastewater pollutants in primary and secondary tin process wastewater introduced into a POTW must not exceed the following values:

(a) Smelter Scrubber.

PSES FOR THE PRIMARY AND SECONDARY TIN SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (poun pounds) of duced	ds per millior tin mstal pro
Antimony	41.830	178.640
Lead	6.068	2.817
Nickel	11.920	8.018
Cyanide (total)	4.334	1.734
		4 000 00/
Ammon:a (as N)	2,892.000	1,269.000
Ammonia (as N) Fluoride	2,892.000 758.500	1,269.000

#### (b) Dealuminizing Rinse.

PSES FOR THE PRIMARY AND SECONDARY TIN SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (poun pounds) of scrap produ	dealuminized
Antimony	0.068	0.030
Lead	0.010	0.005
Nickel	0.019	0.013
Cyanide (total)	0.007	0.003
Ammonia (as N)	4.670	2.050
	4 000	0.700
Fluorida	1.225 0.120	0.050

(c) Tin Hydroxıde Wash.

#### PSES FOR THE PRIMARY AND SECONDARY TIN SUBCATEGORY

	•	
Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (poun poundo) of washed	da per million tin hydroxida
Antimony	23.070	10.260
Load	3.347	1.654
Nickel	6.574	4.423
Cyarida (total)	2.391	0.957
Ammon:a (as N)	1,595,000	700,000
Fluorida	418,400	239,100
Tin	39,400	10.100

# (d) Spent Electrowinning Solution from New Scrap.

#### PSES FOR THE PRIMARY AND SECONDARY TIN SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (poun pounds) o tin produce	l clockolytia
Antimony	32.430	14,450
Lead	4,704	2.184
Nickel	9.240	6.216
Cyanide (total)	3.360	1,344
Ammonia (as N)	2.242.000	983.800
Fluorida	588.000	038,000
	\$5,380	22,740

# (e) Spent Electrowinning Solution from Municipal Solid Waste.

PSES FOR THE PRIMARY AND SECONDARY TIN SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
		*

mg/kg (pounds per million pounds) of dealuminized MSW screp processed

0,102
3 0.015
5 0 0 4 4
4 0.009
0 0.970
5 2.380
0.160

#### (f) Tin Mud Acıd Neutralization Filtrate

#### PSES FOR THE PRIMARY AND SECONDARY TIN SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly averago
		la par million 1 nautralized tin mud pro-
Antimony	9,741	4.341
	9,741 1,413	
Antimony Lead Nickel		4.341 0.656 1.860
Lead	1.413	0.656
Lead Nickel	1.413 2,770	0.656 1.868
Lead Nickel Cyanide (total)	1.413 2,770 1.010	0.656 1.868 0.404

(g) Tin Hydroxide Supernatant from Scrap.

#### PSES FOR THE PRIMARY AND SECONDARY TIN SUBCATEGORY

um Maximum 1 for monthly average

gring (pounds per mullon pounds) of tin metal produced

Алтітолу	107.400	47.650
Lezd	15.580	7.233
Nickel	30.600	20.590
Cyanide (total)	11.130	4.451
Ammenia (as N)	7,427.000	3,259.000
Fluoride	1,348.000	1,113.000
Tin	183.500	75.310

(h) Tin Hvdroxıde Supernatant from Spent Plating Solutions.

#### PSES FOR THE PRIMARY AND SECONDARY TIN SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
mg/kg (pounds per millon pounds) of tin metal pro- duced		
Antimony Lead Nickel Cyaride (total) Ammorua (as N) Fluoride Tin	73.300 10.640 20.830 7.600 5.067.000 1,329.000 125.200	32.660 4.937 14.050 3.039 2.223.000 759.600 51.400

#### (i) Tin Hydroxide Supernatant from Sludge Solids.

#### PSES FOR THE PRIMARY AND SECONDARY TIN SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
		ds per m∷on tin metal pro-
Antimony	321.100	143.100
Lead	46.580	21.630
Nickel	91.500	61.560
Cvanide (total)	33.280	13.310
Ammonia (as N)	22,200.000	9,743.000
Fluonde	5,823.000	3.327.000

548.400

225.190

Lead.

# (j) Tin Hydroxide Filtrate.

Tin.

#### PSES FOR THE PRIMARY AND SECONDARY TIN SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (poun pounds) of duced	ds per millon tin metal pro-
Antimony	48,340 7.013 13.789 5.009 3,342.000 876,600	21,540 3,256 9,266 2,003 1,457,009 500,900

#### PSES FOR THE PRIMARY AND SECONDARY TIN SUBCATEGORY-Continued

Pollutant or pollutant property	list cay 1 day	Maximum for granubly granga
Tin	CC 543	33200

§ 421.296 Pretreatment standards for new sources.

Except as provided in 40 CFR 403.7. any new source subject to this subpart which introduces pollutants into a publicly owned treatment works must comply with 40 CFR Part 403 and achieve the following pretreatment standards for new sources. The mass of wastewater pollutants in primary and secondary tin process wastewater introduced into a POTW shall not exceed the following values: (a) Smelter Scrubber.

PSNS FOR THE PRIMARY AND SECONDARY TIN SUBCATECORY

Moximum of eny 1 day	אבאראשו לכי הבאשא שיכובנסא
	ನಾ bet ಬ್ಲ್ರಾಲ ಕಾರ್ಯವರ್ಷ
41 000	18 649
	rg/kg (source poundo) of cured

71 420

2192.000 750.500

4.334

1 734 1.269990

433400

23233

# (b) Dealuminizing Rinse.

Fluendo.

. Tín

Oyantia (tetal)

Ammonia (co N)

PSNS FOR THE PRIMARY AND SECONDARY TIN SUBCATEGORY

Pollutant or pollutant property	y 1 day
---------------------------------	---------

רשולאס (בכנושלה בכי הו בינואלאס (בכנושלה בסובף ביבינות ב		doolurur.zed
Antmony Lead Nekel Gyanda (tata!) Ammena (cs N) Fluendo	0023 0910 0019 0037 4670 1,225	0 020 0 035 0 013 0 003 2 050 0 760
Tín	0 120	0 659

# (c) Tin Hydroxide Wash.

#### PSNS FOR THE PRIMARY AND SECONDARY TIN SUBCATEGORY

Pellulant or pollulant proporty	Maximum of City 1 City	Maximum fer manoby gvorogo
	mgikg (prom promos) of wathed	ದು per ಹಸಿತಾ ರೂ ಗ್ರಾಶಿಷ್ಟರಂ

#### 10.000 1.554 4.423 23 070 Antimon 3347 6574 2331 Makel Cyan:de (total) 0.957

#### PSNS FOR THE PRIMARY AND SECONDARY TIN SUBCATEGORY-Continued

Fellutant or pollutant property	Maximum of any 1 day	Maximum fer monthly average
Ammona (cs N)	1,535.000 418.400	700 000 239,100
F2:2:23	418,400 33,400	15,180

# (d) Spent Electrowinning Solution From New Scrap.

#### PSNS FOR THE PRIMARY AND SECONDARY TIN SUBCATEGORY

Pellidant or pellidant property	Maxmum of any 1 day	Maximum for monthly everage
	ng/kg (poun pounds) o tin produce	i cleansiyta
ATITERY	32,430	14,450
Lead	4.704	2.124
N'-kct	9,240	6.216
Cyando ('a'a')	3.360	1.344
Annana (20 M)	2,242.000	923.830
Fi2750	583.000	336.000
To	55.220	22.740

#### (e) Spent Electrowinning Solution From Municipal Solid Waste.

#### PSNS FOR THE PRIMARY AND SECONDARY TIN SUBCATEGORY

Pellutant or pellutant property	Maximum of any 1 day	Maximum for monthly average

mg/kg (pounds per millen
pounds) of dealuminized
MSW scrap processed

ATLACTY	0239	0.102
Lccd	0.033	0.015
K20	0.065	0.044
Crando (1022)	0.024	0.009
ATT TOT O (10 N)	15.820	6.970
FL:17:0	4.165	2.330
TJ	0.359	0.160

## (f) Tin Mud Acid Neutralization Filtrate.

#### PSNS FOR THE PRIMARY AND SECONDARY TIN SUBCATEGORY

Poliziani er poliziani proporty	Maximum of any 1 day	Meconum for monthly everage
		is per millen 1 neutralized ta mud pro-
Asimony Lead Kakal Gyanda (tata) Ammena (ea fi) Fizanda Tin	9.741 1.413 2.776 1.010 673.500 176.700 16.640	4.341 0.656 1.£83 0.434 293.600 101.000 6.820

(g) Tin Hydroxide Supernatant From Scrap.

PSNS FOR THE PRIMARY AND SECONDARY TIN SUBCATEGORY

Pollutant or pollutant property	Maximum of any 1 day	Maximum for monthly average
	mg/kg (poun pounds) of duced	ds per million tin metal pro-
Antimony	107.400	47.850
Lead	15.580	7.233
Nickel	30.600	20.590
Cyanide (total)	11.130	4.451
Ammonia (as N)		3,259.000
Fluoride	1.948.000	1,113,000

(h) Tin Hydroxıde Supernatant From Spent Plating Solutions.

183.500

75.310

PSNS FOR THE PRIMARY AND SECONDARY TIN SUBCATEGORY

Pollutant or pollutant property	Maximum of any 1 day	Maximum for monthly average	
	mg/kg (pound pounds) of duced	ds per millior tin metal pro-	
Antimony	73.300	32.660	
Lead	10.640	4.937	
Nickol	20.890	14.050	
Cyanide (total)	7.600	3.03	
Ammonia (as N)	5,087.000	2,223.00	
Fluoride	1,329.000	759.60	
	125,200	51.40	

(i) Tin Hydroxıde Supernatant Fròm Sludge Solids.

#### PSNS FOR THE PRIMARY AND SECONDARY TIN SUBCATEGORY

Pollutaet or pollutant property	Maximum of any 1 day	Maximum for monthly average
		da per million tin metal pro-
Antimony	321.100	-143.100
Lead	48.580	21.630
Nickel	91.500	61.560
Cyanide (total)	33.280	13.310
Ammonia (as N)	22.200.000	9,743.000
Fluoride	5.823.000	3,327,000
Tin	548,400	225.190

#### (j) Tin Hydroxide Filtrate.

#### PSNS FOR THE PRIMARY AND SECONDARY TIN SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	malka loouo	ds per million

mg/kg (pounds per million pounds) of tin metal produced

Antimony Lead Nickel Cvanide (total)	7.013 13.780	21.540 3.256 9.268 2.003
Ammonia (as N) Fluoride Tin		1,467.000 500.900 33.900

#### § 421.297 [Reserved]

Subpart AD—Primary and Secondary Titanium Subcategory

§ 421.300 Applicability: description of the primary and secondary titanium subcategory.

(a) The provisions of this subpart are applicable to discharges resulting from the production of titanium at primary and secondary titanium facilities.

(b) There are two levels of BPT, BAT, NSPS, PSES, and PSNS provisions for this subpart. Level A is applicable to facilities which practice vacuum distillation for sponge purification and which do not practice electrolytic recovery of magnesium. Level B is applicable to all other primary and secondary titanium facilities.

# § 421.301 Specialized definitions.

For the purpose of this subpart the general definitions, abbreviations, and methods of analysis set forth in 40 CFR Part 401 shall apply to this subpart.

§ 421.302 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available.

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

(a) Level A.

Titan:um..... Oil and Grease.

oH.

Total suspended solids

(1) Chlorination Off-Gas Wet Air Pollution Control.

BPT LIMITATIONS FOR THE PRIMARY AND SECONDARY TITANIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for-any 1 day	Maximum for monthly average	
-		ds per million iCl, produced	
Chromum (total)	0.412	0.169	
Lead	0.393	0.187	
Nickel	1.797	1.189	
Thallium	1.919	0.786	
Fluonde	32.760	18.720	
Titan:um	0.412	0.169	

			-							
ı	Within	the	range	of	7.5	to	10.0	at	all	times

(2) Chlorination Area—Vent Wet Air Pollution Control.

18.720

38,380

(1)

11.230

18.250 (<sup>1</sup>)

#### BPT LIMITATIONS FOR THE PRIMARY AND SECONDARY TITANIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (poun pounds) of T	
Chromium (total) Lead Nickel Fluoride Fluoride Oil and Grease Oil and Grease Total suspended solids	0.458 0.437 1.997 2.132 36.400 0.458 20.800 42 640 (1)	0,187 0.208 1.321 0.874 20.800 0.187 12 480 20.260

\* Within the range of 7.5 to 10.0 at all times.

(3) TiCl<sub>4</sub> Handling Wet Air Pollution Control.

BPT LIMITATIONS FOR THE PRIMARY AND SECONDARY TITANIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average

mg/kg i	(pou	nda j	<b>h</b> Sd	million
pounds	) of '	TICI.	pro	iducod

Chromium (total)	0.082	0.034
Lead	0.079	0.037
Nickel	0.359	0.239
Thallium	0.383	0,157
Fluoride	6.545	3,740
Titanum	0.062	0.034
Oil and Grease	3.740	2 244
Total suspended solids	7.667	3.647
рН	(9)	()

\* Within the range of 7.5 to 10.0 at all times.

(4) Sponge Crushing and Screening Wet Air Pollution Control.

#### BPT LIMITATIONS FOR THE PRIMARY AND SECONDARY TITANIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average	
	mg/kg (pounds per milli pounds) of lilanium pr duced		
Chromium	2.847	1.165	
Lead	2.718	1.294	
Nickel	12.420	8 217	
Thal'um	13.270	5.435	
	000 000	400 400	

Fluonde	226.500	129,400
Titan:um	2.847	1.165
Oil and Greace		77.640
Total suspended solids	265.300	120.200
pH	(*)	(1)

\* Within the range of 7.5 to 10.0 at all times.

#### (b) Level B.

(1) Chlorination Off-Gas Wet Air Pollution Control.

BPT LIMITATIONS FOR THE PRIMARY AND SECONDARY TITANIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average	
	mg/kg (pounds por million pounds) of TiCl, produced		
	pounds) of T	iCl <sub>4</sub> produced	

Tin.

BPT LIMITATIONS FOR THE PRIMARY AND SEC-ONDARY TITANIUM SUBCATEGORY-Continued

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
Nickel	1.797 1.919 32.760 0.412 18.720 38.380 ( <sup>1</sup> )	1.189 0.786 18.720 0.169 11.230 18.250 ( <sup>2</sup> )

<sup>1</sup> Within the range of 7.5 to 10.0 at all times.

(2) Chlorination Area-Vent Wet Air Pollution Control.

#### **BPT LIMITATIONS FOR THE PRIMARY AND** SECONDARY TITANIUM SUBCATEGORY

Pollutant or pollutant property		Maximum for monthly average
---------------------------------	--	-----------------------------------

mg/kg (pounds per million pounds) of TiCL produced

Chromum (total)	0 453	0.187
Lead	0.437	0.203
Nickel	1,997	1.321
Thallium	2,132	0.874
Fiuonda	36,400	20.600
Titan:um	0.458	0.187
Oil and grease	20.800	12 480
Total suspended solids	42.640	20,280
pH	(4)	(4)

\* Within the range of 7.5 to 10.0 at all times.

#### (3) TiCl<sub>4</sub> Handling Wet Air Pollution Control.

#### BPT LIMITATIONS FOR THE PRIMARY AND SECONDARY TITANIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for mentity averago	
	mg/kg (pounds per millon pounds) of TiOL produced		
Chromum (total)	0.082	0.034	
Lead.	0.079	0.037	
Nickel	0.359	0,239	
Tha''um	0.383	0.157	
Fluoride	6.545	3.740	
Titan:um	0.082	0.034	
Oil and grease		2.244	
Total suspended solids	7.667	3.647	
pH	1 (P)	(1)	

\* Within the range of 7.5 to 10.0 at all times

(4) Reduction Area Wet Air Pollution Control.

#### BPT LIMITATIONS FOR THE PRIMARY AND SECONDARY TITANIUM SUBCATEGORY

Pollutant or pollutant property	Maximum fer any 1 day	Meximum for monthly average	
	mg/kg (pounds per million pounds) of titinum pro- duced		
Chromum (total)	18.180 17.350	7.435 8.261	
Nickel	79.300	52.460	
Thailium	84.670	34.700	
Fluoride	1,446.000	826,100	
Titan:um	18.180	7.435	
Oil and grease	826.100	435.700	

#### BPT LIMITATIONS FOR THE PRIMARY AND SEC-ONDARY TITANIUM SUBCATEGORY-CONUNued

Pellulant or pollutant preparty	Maumum for cny 1 day	Maxmum for manifally everage
Total suspended solids	1,034 <b>0</b> 00	E05.400
pH	(*)	(*)

\* Within the range of 7.5 to 100 ct all times.

(5) Melt Cell Wet Air Pollution Control.

BPT LIMITATIONS FOR THE PRIMARY AND SECONDARY TITANIUM SUBCATEGORY

Pollutant or pollutant property	Maximum ler any 1 day	Materian for monody svorogo
---------------------------------	-----------------------------	-----------------------------------

	mgikg (pounds per millon pounds) of Library pro- duced	
Ohromeum (totel)	9352	3 828
Lead	6.997	4.251
N.skel	498'0	20.630
The un	9352	3 026
Fluondo	743 900	425.160
Titerum	87 140	35 900
OJ and greace	425,100	255 100
Tetal suspended solds	071400	414 500
¢н	(1)	(')

# \* Within the range of 7.5 to 100 ct cl times.

(6) Cathode Gas Wet Air Pollution Control.

#### BPT LIMITATIONS FOR THE PRIMARY AND SECONDARY TITANIUM SUBCATECORY

Pellutant or pellutant property	ಗಿರುವಾದಗ ಮಿಂದ್ರಾ 1 ದ್ರಾ	Maranan Ist marady Everage
	m3/kg (pram pramia) ci datoti	és per milien Lienem pro-
Chremum (tete!) Leed Natel That'um Fluendo Titanum OJ and greaso Tetal suspended solids pH	2765 2692 11 800 215600 2765 173670 6700 (1)	1 107 1 233 7 237 5 124 123 059 1.107 73 770 119 553 (1)

\* Widen the range of 7.5 to 10.0 at all times.

(7) Chlorine Liquefaction Wet Air Pollution Control.

BPT LIMITATIONS FOR THE PRIMARY AND SECONDARY TITANIUM SUBCATEGORY

Pollulant or pallulant property	ಗತರಾವಾ 1a cry 1 cry	Maurush Isz mostóły ovorogo
	m3'kg (pruss prussi) ci durad	ta par milian 1997 milian
Chromium (tota)	153 000 155 000 571 600 571 600 19.409 600 10.409 600 10.200 5 351 600 12.000 000 (1)	53503 5350 377503 505055 555053 3571603 5050505 5050502 (1)

#### \* Within the range of 7.5 to 10.0 at all times.

#### (8) Sodium Reduction Container Reconditioning Wash.

**BPT LIMITATIONS FOR THE PRIMARY AND** SECONDARY TITANIUM SUBCATEGORY

Pellutant or pollutant property	Maximum for any 1 day	Maximum for monitrity average
		is per millen biaraam pro-
Chranten (1912)	0.554 0.533 2.452 2.623 44.870 0.554 25.640 52.550	0.231 0.255 1.623 1.077 25.640 0.231 15.330 25.000
¢H	0	(*)

\*Within the range of 7.5 to 10.0 at all times.

#### (9) Chip Crushing Wet Air Pollution Control.

#### BPT LIMITATIONS FOR THE PRIMARY AND SECONDARY TITANIUM SUBCATEGORY

Fellicizat or policizat property	Kacrum far any 1 day	Maxmum for mentility average
		is per millen tiznum pro-
Ciacanana (tetal)	10.050	4.126
Lood	9.627	4.534
Niziel	44.010	23,110
The state of the s	45.930	19.250
F127.20	802200	458,403
Timest	10.030	4.126
C) and Grosso	453400	275.100
Total suspended selide	553260	447.000
FN	(1)	(*)
· ·	<b>.</b>	

Witten the range of 7.5 to 10.0 at 22 times.

#### (10) Acid Leachate and Rinse Water.

#### BPT LIMITATIONS FOR THE PRIMARY AND SECONDARY TITANIUM SUBCATEGORY

Pellularit er pellularit property	Marmum for any 1 day	Maximum for mentity average

	mg/kg (pounds per millen pounds) et tanum pro- duced	
Civernum ('ata')	5.210	2.131
Lcod	4.973	2383
Ketcl	22,730	15.040
The second	24,270	9945
Fbs:://	414.400	238800
Tizaum	5.210	2,131
OJ and Greaco	235.800	142100
Total suspended selles	435.500	·2:0.900
¢НК3	(4)	(*)

Within the range of 7.5 to 100 at all trres.

#### (11) Sponge Crushing and Screening Wet Air Pollution Control.

#### BPT LIMITATIONS FOR THE PRIMARY AND SECONDARY TITANIUM SUBCATEGORY

26458

SECONDART ITTANIO	M SUBCATE	GURT
Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (pound pounds) of duced	ds per million titan:um pro-
Chromium (total)	2.847	1.165
Lead	2.718	1.294
Nickeł	12.420	8.217
Thallium	13.270	5.435
Fluoride	226.500	129.400
Titanum	2.847	1.165
Oil and Grease	129.400	77.640
Total suspended solids	265.300	126.200
юН	(4)	ല

#### <sup>1</sup> Within the range of 7.5 to 10.0 at all times.

#### (12) Acid Pickle and Wash Water.

# BPT LIMITATIONS FOR THE PRIMARY AND SECONDARY TITANIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg.(poun pounds) of tit	
Chromium ((total) Lead Nickel Thallium Fluorida Titanium Oil and Grease Otal suspended solids pH	0.027 0.028 0.117 0.125 2.135 0.027 1.220 2.501 (¹)	0.011 0.012 0.077 0.051 1.220 0.011 0.732 1.190 ( <sup>3</sup> )

<sup>1</sup> Within the range of 7.5 to 10.0 at all times.

(13) Scrap Milling Wet Aır Pollution Control.

# BPT LIMITATIONS FOR THE PRIMARY AND SECONDARY TITANIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (poun pounds) of	ds per million scrap milled

Chromum (total)	0.995	0.407
Lcad	0.950	0.452
Nickel	4.341	2.871
Thallium	4.635	1.899
Fluoride	79.140	45.220
Titanium	0.995	0.407
Oil and Grease	45.220	27.130
Total suspended solids	92.700	44.090
،,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	(?),	(*)

<sup>1</sup> Within the range of 7.5 to 10.0 at all times.

(14) Scrap Detergent Wash Water.

#### BPT LIMITATIONS FOR THE PRIMARY AND SECONDARY TITANIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (poun pounds) of s	

Chromium (total)	7.948	3.252
Lead	7.587	3.613
Nickel	34.680	22.940
Thallium	37.030	15.180
Fluorido	632,300	361.300
Titan:um	74.060	32.520

BPT LIMITATIONS FOR THE PRIMARY AND SEC-ONDARY TITANIUM SUBCATEGORY-Continued

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
Oil and Grease	361.300	216.800
Total suspended solids pH	740.600 (۱)	352.300 ( <sup>1</sup> )

<sup>1</sup> Within the range of 7.5 to 10.0 at all times.

(15) Casting Crucible Wash Water.

BPT LIMITATIONS FOR THE PRIMARY AND SECONDARY TITANIUM SUBCATEGORY

Pollutant of pollutant property	Maximum for any 1 day	Maximum for monthly average

mg/ kg (p	DOU	nas pe	r mailion
pounds	) of	titan:u	m cast

	Chrom:um (total)	0.210	0.086
1	Lead	. 0.200	0.095
	Nickél	0.916	0.606
	Thallium	0.978	0.401
	Fluoride	16.700	9.540
	Titan:um	0:210	0.086
1	Oil and Grease	9.540	5.724
'	Total suspended solids	19.560	9.302
5	pH	(")	(7)
1			

Within the range of 7.5 to 10.0 at all times.

# (16) Casting Contact Cooling Water.

BPT LIMITATIONS FOR THE PRIMARY AND SECONDARY TITANIUM SUBCATEGORY

Pollutant of pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (poun pounds) of t	
Chromium (total)	321.100	131.400
Lead	306.500	146.000
Nickel	1,401.000	1926.800
Thallium	1,496,000	613.000
Fluoride	25,540.000	14,600.000
Titanium	321.100	131.400
Oil and Grease	14,600.000	8,757.000
Total suspended solids	29,920.000	74,230.000
nH	- m	(1)

Within the range of 7.5 to 10.0 at all times.

§ 421.303 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable.

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

#### (a) Level A.

(1) Chlorination Off-Gas Wet Air Pollution Control.

#### BAT LIMITATIONS FOR THE PRIMARY AND SECONDARY TITANIUM SUBCATEGORY

Pollutant of pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (pounds per millio pounds) of TiCl, produce	
Chromium (total)	0.412 0.393	0.169
Nickel	1.797	1,169 0,769
Fluonde Titan.um	32.760 0.412	18,720 0,169

(2) Chlorination Area-Vent Wet Air Pollution Control.

# BAT LIMITATIONS FOR THE PRIMARY AND SECONDARY TITANIUM SUBCATEGORY

Pollutant of pollutant property	Maximum for any 1 day	Maximum for monthly .average
	mg/kg (poun pounds) of Ti	
Chromum (totat) Lead Nickel Thallium Fluoride Titanum	0.458, 0.437 1.997, 2.132 38.400 0.458	0,187 0.208 1.321 0.874 20.800 0.187

# (3) TiCl, Handling Wet Aır Pollution Control.

BAT LIMITATIONS FOR THE PRIMARY AND SECONDARY TITANIUM SUBCATEGORY

Pollutant of pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (poun poundo) of Ti	
Chromium (total) Lead Nickel Thallium Fluonde Titanium	0.082 0.079 0.359 0.383 6.545 0.082	0.034 0 037 0 238 0.157 3.740 0.034

(4) Sponge Crushing and Screening Wet Air Pollution Control.

#### BAT LIMITATIONS FOR THE PRIMARY AND SECONDARY TITANIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (poun pounds) of duced	titanium pro-
Chromium (total)	0.285	0.117
Lead	0.272	0,129
Nickel	1.242	0 822
		~ ~ ~ ~
Thallium	1.327	0.544
	1.327 22.650	0.544 12.940

(b) Level B.

(1) Chlorination Off-Gas Wet Air Pollution Control

#### BAT LIMITATIONS FOR THE PRIMARY AND SECONDARY TITANIUM SUBCATEGORY

Pollutant er pollutant property	Maximum for any 1 day	Maximum for monthly average
		ds per millen iOL produced
Chromrum (total)	0.346	0.140 0.122
Nickel	0.515	0.346
Thalfum	1.311	0.534
Fluoride	32,760	18.720
Titanium	0.346	0.140
	1	

(2) Chlorination Area-Vent Wet Air Pollution Control

#### SECONDARY TITANIUM SUBCATEGORY Maximum for monthly Maximum for any 1 Pollutant or pollutant property

BAT LIMITATIONS FOR THE PRIMARY AND

	day	everage
		ds per million iCL produced
Chromum (total)	. 0.385	0.156

Fluoride	36.400 0.385	20.600 0.155
Nickel Tha!ium	0.572 1.456	0.385
Lead	0.385	0.155

# (3) TiCl<sub>4</sub> Handling Wet Air Pollution Control.

#### BAT LIMITATIONS FOR THE PRIMARY AND SECONDARY TITANIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (poun pounds) of Ti	

Chrom:um (total)	0.069	0.023
Lead	0.052	0.024
Nickel	0.103	0.069
Thailium	0.262	0.107
Fluoride	6.545	3.740
Titan:um	0.069	0.028

(4) Reduction Area Wet Air Pollution Control.

# BAT LIMITATIONS FOR THE PRIMARY AND SECONDARY TITANIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (poun pounds) of duced	ds per millen Etanum pro-
<		
Chromum (total)	1.528	0.620
	1.528	0.620
Lead		
Lead Nickel	1.157	0.537
Chromum (tota) Lead	1.157 2.272	0.537 1.528

(5) Melt Cell Wet Air Pollution - Control.

#### BAT LIMITATIONS FOR THE PRIMARY AND SECONDARY TITANIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 doy	Maxmum for mentity swengt	
		ನು per ಹಸ್ತನಾ ಟಿಎಸಎನಾ pro-	
Dhromum (lotal) .cad Nickel Theffum Fuendo	0.707 0£35 1.170 2.977 74 410	0310 0278 0787 1212 42520	
liten um	0.787	0.310	Ł

(6) Cathode Gas Wet Air Pollution Control.

#### BAT LIMITATIONS FOR THE PRIMARY AND SECONDARY TITANIUM SUBCATEGORY

Pellutant er pallutant property	Maximum for ony 1 doy	Maximum for manoby average
		to per milion Linnum pro-
Chromeum (toto)	0.213	0 632 0.000
Nokel	0.303	0223 0251
Fluendo	21 530	12300
Titen:um	023	0 0 3 2

#### (7) Chlorine Liquefaction Wet Air Pollution Control.

#### BAT LIMITATIONS FOR THE PRIMARY AND SECONDARY TITANIUM SUBCATEGORY

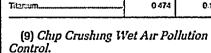
Pollutant or pollutant property	Maximum for any 1 day	Maximum for manualy evorage
mg/kg (pound) per milion pound) et tionum pro- éused		
Chromium (teici) Lead Nekel Theiram Fluendo Titenam	11 010 8.332 16.370 41 000 1.042 000 11.010	4 484 3 883 11.010 10.580 505,180 4 484

# (8) Sodium Reduction Container Reconditioning Wash.

- BAT LIMITATIONS FOR THE PRIMARY AND SECONDARY TITANIUM SUECATEGORY
- Maximum far manal Pollulant or pollulant property 107 057 1 057 6.0210 mg/kg (seundo per milion poundo) ef Lionum pro-cupod Chremann (total) 0474 0.192 0.167 Lcad. 0323 0.474 0.731 25.649 0.192 0.705 N.ckcl\_

1.705

44,870



Thellum

Fluendo

#### BAT LIMITATIONS FOR THE PRIMARY AND SECONDARY TITANIUM SUBCATEGORY

Pellutani er pallutani property	Maxmum for any 1 day	Maximum for monthly average
		ds per milion titinum pro-
Cisconero (tata)	0.843	0.344
Lect	0.£42	0.233
Nizkci	1.261	0.843
Tro:	3.203	1.306
Fluorato	E0.220	45.847
Tieram	0.E43	0.344

# (10) Acid Leachate and Rinse Water.

BAT LIMITATIONS FOR THE PRIMARY AND

SECONDARY TITANIUM SUBCATEGORY

Pellidant or pellidant property	Maximum far any 1 day	Maximum for monthly average
		ds per millen Litanum pro-

		· · · · · · · · · · · · · · · · · · ·
Chuemann (lota)	4.331	1.776
Lood	3.315	1.539
Nickel	6.512	4.331
Trefum	16.520	6.743
Factoria	414,400	2:5.200
Titorion	4.331	1.776

#### (11) Sponge Crushing and Screening Wet Air Pollution Control.

#### BAT LIMITATIONS FOR THE PRIMARY AND SECONDARY TITANIUM SUBCATEGORY

Pellutant or pollutant property	Maximum for any 1 day	Macmum for monthly average
		ds per millen tizmum pro-
ಡುಕನಾಲನ (ಟಿಟ್) Lead Noted	0.239 0.181 0.356	0.037 0.034 0.239
Ռษ‴ษท ⊼ษะก⊴ว ก!วกษฑ	0.503 22.650 0.233	0.383 12.940 0.097
۵		0.037

# (12) Acid Pickle and Wash Water.

1 1

> BAT LIMITATIONS FOR THE PRIMARY AND SECONDARY TITANIUM SUBCATEGORY

Pellidant or pellidant property	Maximum for any 1 day	Maximum for mentity average
	mg/kg (peun peundo) ef tit	
ຊີສະດາະນາ (ເວເວ) ເວລີ ເວລີດ: ກາວໂນກ ກັນລາຍດີ ກັນລາຍກ	0.023 0.017 0.024 0.035 2.135 0.023	0.009 0.003 0.023 0.035 1.220 0.009

(13) Scrap Milling Wet Air Pollution Control.

	rai Kegi	ster / vc
BAT LIMITATIONS FOR		
SECONDARY TITANIL		
Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
•		nds per million scrap milled
Chromium (total)		0.034
Lead Nicket	0.064 0.125	0.030
Fhallium	. 0.318	0.129
Fluoride Fitanium	. 7.945 . 0.084	4.540 0.034
(14) Scrap Detergen	nt Wash W	L Vater.
BAT LIMITATIONS FOR SECONDARY TITANIL		
Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthiy average
	mg/kg (pour	ids per million scrap washed
Chromium (total)		2.710
.ead	. 5.058	2.349
Vicket Thallium	. 9.935 . 25.290	6.684 10.300
luoride	. 632.300	361.300
fitanium	. 6.684	2.710
(15) <i>Casting Crucib.</i> BAT Limitations for Secondary Titaniu	THE PRIMA	RY AND
Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
		ds per million Litanium cast
hromum (total)		0.072
.ead lickel		0.062
'hallium	0.668	0.177
luoride ītanium	. 16.700 0.177	9.540 0.072
(16) <i>Casting Contac</i> BAT LIMITATIONS FOR		
SECONDARY TITANIU	1	
Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
		ds per million Itanium cast
		10.950
hrom:um (total)	27.000 20.430	
ead lickel	20.430 40.140	9.487 27.000
ead lickel hallium	20.430 40.140 102.200	9.487 27.000 41.600
ead lickel	20.430 40.140	9.487 27.000
ead lickel hallium luoride	20.430 40.140 102.200 2,554.000	9.487 27.000 41.600 1,460.000

source performance standards:

(a) Level A. (1) Chlorination Off-Gas Wet Air Pollution Control.

NSPS FOR THE PRIMARY AND SECONDARY TITANIUM SUBCATEGORY			
Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average	
		ds per million iCl4 produced	
Chromum (total)	0.412	0.169	
Lead	0.393	0.187	
Nickel	1.797 1.919	1.189 0.786	
Fluoride	32,760	18.720	
Titan:um	0.412	0.169	
Total suspended solids Oil and Grease	38.380 18.720	18.250 11.230	
pH	(*)	(1)	
	0 -1 -11		
<sup>1</sup> Within the range of 7.5 to 10.0 at all times. (2) Chlorination Area-Vent Wet Air Pollution Control.			
NSPS FOR THE PRIMAR TITANIUM SUB		ONDARY	
Delivinet et sellutert susset	*Maximum	Maximum	
Pollutant or pollutant property	for any 1 day	for monthly average	
mg/kg (pounds per million pounds) of TrCl, produced			
Chromium (total)	0.458	0.187	
Lead Nickel	0.437	0.208	
Thallium	1.997 2.132	1.321 0.874	
Fluoride	36.400	20.800	
Titan:um Total suspended solids	0.458 42.640	0.187	
Oil and Grease	20.800	20.280 12.280	
рН	(*)	(1)	
<sup>1</sup> Within the range of 7.5 to 10.	0 at all times.		
(3) <i>TiCl</i> 4 Handling V Control.	Vet Aır Po	llution	
NSPS FOR THE PRIMAR TITANIUM SUB		ONDARY	
Poliutant or pollutant property	Maximum for any 1 day	Maximum for monthly average	
	mg/kg (pound pounds) of Tr		
Chrom:um (total)	0.082	0.034	
Lead Nickel	0.079	0.037	
Thallium	0.359	0.238 0.157	
Fluorida	6.545	3.740	
Titanum Total suspended solids	0.082	0.034	
Oil and Grease	7.667 3.740	3.647 2.244	
рН	(1)	(1)	
<sup>1</sup> Within the range of 7.5 to 10,		<u> </u>	
(4) Sponge Crushing and Screening Wet Air Pollution Control.			
NSPS FOR THE PRIMAR	Y AND SECO	NDARY	

-7	avoiago	
	ds per million Cl. produced	Chromium (tota) Lead Nickel Thalliom
0.458 0.437 1.997 2.132 36.400	0.187 0.208 1.321 0.874 20.800	Fluorido Titanum Otl and Greaso Total suspended solido pH
0.458 12.640	0.187 20.280	<sup>1</sup> Within the range of 7.5 to 10
20.800	12.280	

Pollution Control.

#### NSPS FOR THE PRIMARY AND SECONDARY **TITANIUM SUBCATEGORY**

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly averago	
	mg/kg (pounds per million pounds) of TiC1 <sub>4</sub> produced		
Chromum (total)	0.385	0.150	
Lead	0.291	0.135	
Nickel	0.572	0.385	
Thallum	1.456	0.593	
Fluoride	36.400	20,600	
Titanum	0.385	0.150	
Oil and Grease	10.400	10,400	
Total suspended colids	15.600	12.480	
pH	(*)	(4)	

<sup>1</sup> Within the range of 7.5 to 10.0 at all times.

(3) TiC1. Handling Wet Air Pollution Control.

#### NSPS FOR THE PRIMARY AND SECONDARY TITANIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (poun pounds) of Ti	
Chrom:um (total)	0.069	0.028
Lead	0.052	0.024
Nicket	0.103	0.069
Thallium	0.262	0.107
Fluoride	6.545	3.740
Titan:um	0.069	0.028
Oil and Grease	1.870	1.870
Total suspended solids	2.805	2.244

ъ

#### NSPS FOR THE PRIMARY AND SECONDARY **TITANIUM SUBCATEGORY—Continued**

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly averago
Thalium	0.000	0.000
Fluonde	0.000	0.000
Titanium	0.000	0.000
Total suspended solids	0.000	0.000
Oil and Grease	0.000	0.000
pH	(1)	(1)

<sup>1</sup> Within the range of 7.5 to 10.0 at all times.

(b) Level B.

(1) Chlorination Off-Gas Wet Air Pollution Control.

NSPS FOR THE PRIMARY AND SECONDARY TITANIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly averago
---------------------------------	-----------------------------	-----------------------------------

mg/kg (pounds por million pounds) of TiC1, produced I 0.346 0.140

Lead	0.262	0 122
Nickel	0.515	0.346
Thalliom	1.311	0.534
Fluorido	32,760	18,720
Titan:um	0.346	0.140
Oil and Grease	9.360	9,360
Total suspended solids	14.040	11.230
pH	(4)	(1)

0.0 at all timos.

(2) Chlorination Area-Vent Wet Air

r pollutant property	Maximum for any 1 day	Maximum for monthly average	
	mg/kg (poun pounds) of Ti		Chron Lead. Nickel Thalla
lotal)	0.082 0.079	0.034 0.037	Fluorid Titama
*****	0.359 0.383 6.545	0.238 0.157 3.740	Oil an Total : pH

R THE PRIMARY AND SECONDARY TITANIUM SUBCATEGORY

Maximum for any 1 day	Maximum for monthly average	
mg/kg (pounds per million pounds) of titanium pro- duced		
0.000	.0.000	
0.000	0.000	
0.000	0.000	
	for any 1 day mg/kg (pount pounds) of duced 0.000 0.000	

#### NSPS FOR THE PRIMARY AND SECONDARY (7) Chlorine Liquefaction W **TITANIUM SUBCATEGORY—Continued** Pollution Control. Maximum for any 1 day Maximum for monthly NSPS FOR THE PRIMARY AND SE Pollutant or pollutant property evenega TITANIUM SUECATEEOR (1) (1) Pollutant or pollutant property \* Within the range of 7.5 to 10.0 at all times. (4) Reduction Area Wet Air Pollution Control. NSPS FOR THE PRIMARY AND SECONDARY Chrom.um (total) .... Lead. TITANIUM SUBCATEGORY N.altel. Thellum Maximum for any 1 doy Maximum for monthly average Fluorido Pollutant or pollutant property Titantym Ol and grease Total supponded selids mg/kg (pounds per million pH., pounds) of titanium pro-duced "Within the range of 7.5 to 10.0 of oll term Chromum (total) 1.528 0.620 1.157 0.537 (8) Sodium Reduction Conta 1.528 2.354 Nichol 2.272 Reconditioning Wash. 5.782 Thailium 144.600 82.600 0.620 Fluoride 1.528 NSPS FOR THE PRIMARY AND SE Titanum 41.300 49.5E0 Ol and Grease 41.300 TITANIUM SUBCATEGOR Total suspended solids. 61.950 (') (<sup>1</sup>) <sup>1</sup> Within the range of 7.5 to 10.0 at all times. Pollutant or pollutant property (5) Melt Cell Wet Air Pollution Control. NSPS FOR THE PRIMARY AND SECONDARY Chremum (tetal). TITANIUM SUBCATEGORY Lond. Nickel. Maximum for any 1 day Maximum for monthly Thellum Pollutant or pollutant property Finando 8721208 Titanum OI and grocco mg/kg (pounds per millen Total suspended selling. pounds) of titanium proъH. 0.319 0.276 Chromum (total). -0.787 0.595 (9) Chip Crushing Wet Air H Mickel 1.170 0.787 Thallium Control. 74.410 42.520 0.319 Fluorida Titanum NSPS FOR THE PRIMARY AND SE Oil and Grease 21.260 21.260 Total suspended solids. 31,690 25.510 (1) **(**<sup>1</sup>**)** <sup>1</sup> Within the range of 7.5 to 10.0 at all times. (6) Cathode Gas Wet Air Pollution Control. NSPS FOR THE PRIMARY AND SECONDARY TITANIUM SUBCATEGORY Maximum for any 1 day Maximum for monthly average Pollutant or pollutant property mg/kg (pounds per million pounds) of titanum pro-duced Chromum (total) 10 2 2 8 0.032 030.0 0.172 Nickel. 0.338 0.228 0.661 0.351 ThalSum Fluorida 21.530 12.000 0.223 Titan:um 6.150 7.380 OI and Grease 6.150 Total suspended solids. 9,225 (\*) -(\*)

ter eny 1 mg/kg (pe peunic) dured 0 47 0.01 0.70 1.7 44.57 0 43 12.8 1923 Within the range of 7.5 to 10.9 at all time

TITANIUM SUECATEGOR

Pollutant or pollutant property	Maximum for any 1 day	Maximum for manady Everoge

	mgifig (counds per million poundo) of Lionum pro- duced		
Chremum (ioin)	0.019	0000	
Lcod	0.000	0.000	
Nickel	0630	0000	
The	0000	0.000	
Fluctido	0000	0.000	
Titorum	0000	0000	
Ol and grease	0 000	0.000	
Total suppended sellis	0.000	0.000	
pH	C)	()	

Within the range of 7.5 to 10.0 ot all time

#### (10) Acid Leachate and Rins

# ARY

nction Wet Aur		NSFS FOR THE PRIMARY AND SECONDARY TITAMUM SUBCATEGORY		
ny and Sec Category	ondary	Pellutant or pollutant property	Maximum for any 1 day	Maximum for monthly avarage
Marian farany 1 day	Mox.mm far nanddy Evenego			do per millon Danum pro-
mgilig (paun paunas) ci cutod	is per millen Lienum pro-	Chromann (Isla) Lood Nakol Thalian	4361 3315 6512 16580	1.776 1.533 4.531 6.743
C:29 C:20 C:20 C:20 C:20	0000 0000 0000 0000 0000	Flucado Trianum C i and gracco Tetal succended colido EH	414400 4231 118,400 177,600	
6000 6000 6000 6000 6000	0000 0000 0000 0000 0000	Within the range of 7.5 to 19 (11) Sponge Crushin	outalltimes.	L
1 ot oll teres.		Wet Air Pollution Con NSPS for the Primar Titanium Sub	NY AND SEC	ONDARY
RY AND SEC	ONDARY	Fellutant or pollutant property	Maximum for any T day	Maximum for mersby average
CATEGORY	Maxmum far maribly			is per milon Banum pio-
mg/kg (peuni	5,000,0	Chrom.um (Ista) Lood	0.000 0.000 0.000 0.000	0000 0000 0000 0000
0 474 0 259 0 705	0.192 0.157 0.474	Flutrido Tierrorm Ol and grocco Total suspended selfido EH	000.0 000.0 000.0 000.0 000.0 ()	0000 - 0000 0000 0000 ()
1.785 44.670 0.474 12.820	0 731 25 640 0 192 12 620	"Within the range of 7.5 to 10 (12) Acid Pickle and	0 at all brea.	
19203 (۲) مع دال نصحیہ	15,339 (7)	NSPS FOR THE PRIMAR TITANIUM SUB		ONDARY
Vet Aır Pol	llution	Polizioni er polizioni proporty	L'aximum for cny 1 dry	Maximum for menticity arcraige
RY AND SEC	ONDARY		mg/kg (peun peundo) of th	enium pickled
Maximum for any 1 day mg/kg (causa paundo) of durad	Maximum for marchly everysis to per million tionum pro-	Chromern (1010)           Lood           Noted           TheThem           Francis           Thereas           Of and gracoo           Of and gracoo           Tech expended satistic	0.023 0.017 0.024 0.035 2.135 0.023 0.610 0.515	0.03 0.03 0.03 0.03 1.20 0.09 0.00 0.010 0.732
0:00 0:00 0:00 0:00 0:00 0:00	0000 0000 0000 0000 0000	13) Scrop Milling Vi		(1) Ilution
(1990) (1	0000 0000 0000 0000 0000 (7)	Control. NSPS for the Primar Titakium Subi		ONDARY
		Pellutant or pallutant property	Maximum for any 1 day	Maximum for menthly average
<i>ma 191126</i>	vs uter.		mg/kg (peun peundo) of c	
		Checrum (1912) Leod Totkel Thatum	053.0 053.0 053.0 053.0 053.0	0.000 000.00 0.000 0.000

pН

Lead.

pH.

Lezd

pH.

Lead

pH.

<sup>1</sup> Within the range of 7.5 to 10.0 at all times.

NSPS FOR THE PRIMARY AND SECONDARY TITANIUM SUBCATEGORY-Continued

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
Fluonde	0.000	0.000
Titan'um	0.000	0.000
Oil and Grease	0.000	0.000
Total suspended solids	0.000	0.000
pH	(1)	(4)

\* Within the range of 7.5 to 10.0 at all times.

#### (14) Scrap Detergent Wash Water.

#### NSPS FOR THE PRIMARY AND SECONDARY TITANIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (poun pounds) of s	
Chromium (total)	6.684	2.710
Lead	5.058	2.349
Nickel	9.935	6.684
Thailum	25.290	10.300
Fluoride	632.300	361.300
Titan:um	6.684	2.710
Oil and Greace	180.700	180.700
Total suspended solids	271.000	216.600
pH	(1)	(1)

Within the range of 7.5 to 10.0 at all times.

(15) Casting Crucible Wash Water.

#### NSPS FOR THE PRIMARY AND SECONDARY TITANIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (pour pounds) of t	id per million itanium cast
Chromium (total)	0.177	0.072
Lead	0.134	0.082
Nickel	0.262	0.177
Thallium	0.668	0.272
Fluorida	18.700	9.540
Titan:um	0.177	Ó.072
Oil and Grease	4.770	4.770
Total suspended solids	7.155	5.724
рН ,	(1)	(*)

Within the range of 7.5 to 10.0 at all times.

(16) Casting Contact Cooling Water.

NSPS FOR THE PRIMARY AND SECONDARY **TITANIUM SUBCATEGORY** 

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/million (p lion pound: cast	ound per mil- s) of titan:um
Chromlum (total)	27.000	10.950
Lead	20,430	9.487
Nickel	40.140	27.000
Thallium	102.200	41.600
Fluoride	2,554.000	1,460.000
Titanium	27.000	10.950
Oil and grease	729,800	729.800
Total suspended soilds	1,095.000	875.700
pH	(1)	(1)

<sup>1</sup> Within the range of 7.5 to 10.0 at all times.

#### § 421.305 Pretreatment standards for existing sources.

Except as provided in 40 CFR 403.7 and 403.13, any existing source subject to this subpart which introduces pollutants into a publicly owned treatment works must comply with 40 CFR Part 403 and achieve the following pretreatment standards for existing sources. The mass of wastewater pollutants in primary and secondary titanium process wastewater introduced into a POTW must not exceed the following values:

(a) Level A.

#### (1) Chorination Off-Gas Wet Air Pollution Control.

PSES FOR THE PRIMARY AND SECONDARY TITANIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (pour pounds) of Tr	nd per million C1. produced
Chromium (total)	0.412 0.393	0.169 0.187
Nickel Thallium	1.797 1.919	1.189 0.786
Fluorido Titan:um	32.760 0.412	18.720 0.169

#### (2) Chlorination Area-Vent Wet Air Pollution Control.

PSES FOR THE PRIMARY AND SECONDARY **TITANIUM SUBCATEGORY** 

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (poun pounds) of Ti	
Chromum (total)	0.458	0.187
Chrom:um (total)	0.458 0.437	0.187
Lead		
	0.437	0.208
Lead Nickel	0.437 1.997	0.208 1.321

(3) TiCl. Handling Wet Air Pollution Control.

#### PSES FOR THE PRIMARY AND SECONDARY **TITANIUM SUBCATEGORY**

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
		ds per million īCl₄ produced
Chrom:um (total)	0.082	0.034
	0.082 0.079	0.034
Lead		
Lead Nickel	0.079	0.037
Chrom:um (total) Lead Nickel Thallium Fluoride	0.079 0.359	0.037

(4) Sponge Crushing and Screening Wet Air Pollution Control.

#### PSES FOR THE PRIMARY AND SECONDARY TITANIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
		do per million titanium pro-
Chromium (total) Lead Nckel Thalfium Fluoride Titan:um	0.285 0.272 1.242 1.327 22.650 0.285	0.117 0.129 0.822 0.544 12.940 0.117

#### (b) Level B.

#### (1) Chlorination Off-Gas Wet Air Pollution Control.

#### PSES FOR THE PRIMARY AND SECONDARY TITANIUM SUBCATEGORY

Poilutant or pollutant preparty	Maximum for any 1 day	Maximum for monthly average

	mg/kg (pounds per million pounds) of TiCl, produced	
Ctromium (total)	0.340	0.140
Lead	0.262	0.122
Nickel	0.515	0.348
Thallium	1.311	0.534
Fluoride	32.760	18.720
Titanum	0.346	0.140

#### (2) Chlorination Area-Vent Wet Air Pollution Control.

#### PSES FOR THE PRIMARY AND SECONDARY TITANIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
		de mos cuttion

mg/kg (	pounas	per mullon
poundo)	of TiCl	produced

,		
Chromium (total)	0.385	0.150
Lead	0.291	0.135
Nickel	0.572	0.365
Thashum	1.458	0.593
Fluorido	36,400	20,800
Titanium	0.385	0,158

#### (3) TiCl. Handling Wet Air Pollution Control.

#### PSES FOR THE PRIMARY AND SECONDARY TITANIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (poun pounds) of T	do per million iCl4 produced
Chromum (total)	0.069	0.020
	0.069 0.052	0.020 0.024
Lead		
Lead Nickel	0.052	0.024
Chrom:um (total) Lead Nickel Thatium Fluoride	0.052 0.103	0.024

(4) Reduction Area Wet Air Pollution Control.

/

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PSES FOR THE PRIMAR TITANIUM SUB		DNDARY	PSES FOR THE PRIMAR TITANIUM SUE		ONDARY	PSES FOR THE PREMAR TITANUM SUZ	_	ONDARY
Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average	Pollutant or pollutant property	Maximum far any 1 day	Max rum far mantaly avaraga	Pollitarit er pallitarit proporty	Maximum for eny 1 day	Materium for martaly average
	mg/kg (pound pounds) of duced	is per millon titanum pro-			is per millen Lienum pro-			da per millen anum pickled
Chromum (total)	1.528	0.620	Chromium (total)	0 474	0 102	Chromem (Isla)	0.023	0.003
Lead	1.157	0.537	Lccd	0359	0 167	15301	0.034	0.023
Nickel Thallium	2.272 5.782	1.528 2.354	N.ckcl	0.765	0 474	The	0.035	0 635
Fluoride	144.600	82.600	Fluendo	1 785 44 970	0731 25040	F127.00	2.135	1,220
Titan:um	1.528	0.620	Titonum	0 474	0 192		1 0.020	0.03
(5) Melt Cell Wet A. Control.	ır Pollutio	n	(9) Chip Crushing Vi Control.	Vet Aır Po	llution	(13) Scrap Milling V Control.	Vet Aır Po	llution
PSES FOR THE PRIMAR TITANIUM SUB		ONDARY	PSES FOR THE PRIMAF TITANIUM SUE		ONDARY	PSES FOR THE PRIMAP TITAMIUM SUB		ONDARY
	Maxmum	Maximum					Maxmam	Maxmum
Pollutant or pollutant property	lor any 1 day	for monthly average	Pollulant or pollulant property	Maximum for any 1 day	Maximum for monitoly Evenego	Pellinani er pollidani property	for any 1 day	for monthly average
	mg/kg (pound pounds) of duced	da per million titantum pro-		m3/kg (poun poundo) of	ds por milion Lizaum pro-		mg/kg (coun poundo) of	ds per millen sorap milled
				dupped		כוענהשיה (גיב)	0.034	0.034
Chromaum (total)	0.787	0.319 0.276	Chromaum (total)	0 843	0344	Lead	0.064	0.030
Nickel	1.170	0.787	Lead	0642	02:20	Th:://wm	0.318	0.123
Tha!!ium	2.977	1.212	N.skcl.	1.261	0.043	Firmio	7.945	4.540
Fluoride	74.410 0.787	42.520 0.319	Fluorido	3203 80203	1.303 45 640	Tilerum	0.024	0.034
Ingram	0.767	0.313	Titanum	0.843	0.344	<del></del>	ł	1
(6) Cathode Gas We Control.	et Aır Poll	ution	(10) Acıd Leachate	and Rinse	Water.	(14) Scrap Detergen PSES FOR THE PRIMAR	RY AND SEC	
PSES FOR THE PRIMAF		ONDARY	PSES FOR THE PRIMAP TITANIUM SUE		ONDARY	Pellutant or pollutant property	Macmum	Max.mars for monthly
Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average	Pollulant or pollulant property	Maximum for cry 1 day	Maximum for monody Everage	Furnanda ta plantenena planteseg	ng/kg (peur	ds per millen
	pounds) of	ds per million titanum pro-			ido por milion I tianum pro-	Civentum (נוני)	6.634	2710
	duced				·····	Lood Nation	5.053 9.935	2.343
Chromum (totel)	0.223	0.092	Chromum (toto!)	4.231	1 776	Theffum	25.230	10.200
Lead	0.172	030.0	1 Lead	3.315	1563	Faction	632.300	351.300
Nickel	0.338	0.228	Nickel	6.512	4 331 6,743	Ti2::27	6.634	2.710
Fluoride	21.530	12.300	Fizcido.	414,400	23230		<u>.</u>	<u> </u>
Titan:um	0.228	0.092	Titenum	4.231	1.778	(15) Casting Crucib	le Wash I	Vater.
(7) Chlorine Liquefo Pollution Control.	action We	t Aır	(11) Sponge Crushu Wet Aır Pollution Cou		eening	PSES FOR THE PRIMAR TITANIUM SUE		ONDARY
PSES FOR THE PRIMAR TITANIUM SUB		ONDARY	PSES FOR THE PRIMAP		ondary	Pellutant er pellutant proparty	Maumum for any 1 day	Maximum for monthly overage
Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly sverage	Pellulant or pollulant property	Maximum for ony 1 doy	Maximum far manody			ids per million Litanum cast
	pounds) cf	ds per millon Litanium pro-		mg/kg (ptur	da per millan I tianum pro-	Стопия (222) Lead	0.177 0.134 0.262	0.072 0 C62 0 177
	duced	·····		cuend	•	The un	0.663	0.272 9.543
Chromum (total)	11.010	4.464	Chremum (tetal)	0233	0 0 5 7	Fillen J	0.177	, 0.072
Lead	8.332	3.868	Lead	0 181	003/		<u> </u>	<u> </u>
Nickel	16.370 41.660	11.010 16.920	NCoke1	. 0.355	0203	1		
Fluorida	1,042.000	535.100	Fluorido	0.009	0.003	(16) Casting Contac	t Cooling	Water.
Titanum	. 11.010	4,464	Titanum	0.233	0.037			
(8) Sodium Reduction Reconditioning Wash	on Contau	ner	(12) Acıd Pickle and	l d Wash N	l Vater.			

#### PSES FOR THE PRIMARY AND SECONDARY TITANIUM SUBCATEGORY

Pollutant or pollutant property	Maxamum for any 1 day	Maximum for monthly average
	mg/kg (pound pounds) of t	
Chromum (total)	27.000	10.950
	20.430	9.487
LC39		
	40.140	27.000
Nickel		27.000 41.600
Lcad Nickel Thallium Fluoride	40.140	

#### § 421.306 Pretreatment standards for new sources.

Except as provided in 40 CFR Part 403.7, any new source subject to this subpart which introduces pollutants into a publicly owned treatment works must comply with 40 CFR Part 403 and achieve the following pretreatment standards for new sources. The mass of wastewater pollutants in primary and secondary titanium process wastewater introduced into a POTW shall not exceed the following values:

(a) Level A.

(1) Chlorination Off-Gas Wet Air Pollution Control.

#### PSNS FOR THE PRIMARY AND SECONDARY **TITANIUM SUBCATEGORY**

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
		ds per million iCl4 produced
Chromium (total)	0.412	0.169
Lead	0.393	0.187
Nickel	1.797	1.189
Thallium	1.919	0.786
Fluoríde	32.760	18.720
Titan:um	0.412	0.169
		1

#### (2) Chlorination Area-Vent Wet Air Pollution Control.

PSNS FOR THE PRIMARY AND SECONDARY TITANIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (poun pounds) of Ti	
Chrom!um (total)	0.458	0.187
Lead	0.437	0.208
Nickel	1,997	1.321
Thallium	2.132	0.874
Fluoride	36,400	20.800
Titanium	0.458	0.187

(3) TiCl<sub>4</sub> Handling Wet Air Pollution Control.

PSNS FOR THE PRIMAR TITANIUM SUB		ONDARY
Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	malkalaava	ds per million
	pounds) of T	
Chromium (total)		
Chromum (total)	pounds) of T	iCl, produced
Lead	pounds) of T 0.082	iCl, produced
Lead Nickel	pounds) of T 0.082 0.079	iCl <sub>4</sub> produced 0.03 0.03
Lead	pounds) of T 0.082 0.079 0.359	0.03 0.03 0.23

#### (4) Sponge Crushing and Screening Wet Air Pollution Control.

PSNS FOR THE PRIMARY AND SECONDARY TITANIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maxmum for monthly average
		ds per million titanlum pro-
Chromum (total) Lead Nickel Thallium	0.000 0.000 0.000 0.000	0.000 0.000 0.000 0.000

0.000

0.000

0.000

## (b) Level B.

Fluoride

Titan.um

(1) Chlorination Off-Gas Wet Air Pollution Control.

#### PSNS FOR THE PRIMARY AND SECONDARY TITANIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
		ds per million iCl. produced
Chrom:um (total)	0.346	0,140
		0.140
Lead	0.262	0.122
Lead		
	. 0.262	0.122
Lead Nickel	0.262 0.515	0.122 0.346

(2) Chlorination Area-Vent Wet Air Pollution Control.

PSNS FOR THE PRIMARY AND SECONDARY
TITANIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maxmum for monthly _average
		ds per million iCl4 produced
Chromium (total)	0.385	0.156
Lead	0.291	0.135
Nickel	0.572	0.385
Thallium	1.456	0.593
	00,400	20,800
Fluoride	36.400	20.000

(3) TiCl. Handling Wet Air Pollution Control.

#### PSNS FOR THE PRIMARY AND SECONDARY TITANIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
		da per million iCl. produced
Chromium (total)	0.069	0.028
Lead	0.052	0.024
Nickel	0.103	0.089
Thalfum	0.262	0.107
Fluorida	6.545	3,740
Titan:um	0.069	0.020

#### (4) Reduction Area Wet Air Pollution Control.

#### PSNS FOR THE PRIMARY AND SECONDARY TITANIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
		ds per million

	duced	
Chromium (lotal)	1.528 1.157	0.620
Nickel	2.272	1.528
Thallium Fluoride	5.782 144.600	2 354 82.600
Titan:um	1.528	0 620

#### (5) Melt Cell Wet Air Pollution Control.

#### PSNS FOR THE PRIMARY AND SECONDARY **TITANIUM SUBCATEGORY**

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (poun pounds) of duced	də pər milliən litanium pro-
Chromum (total) Lead Nickel Thallium Filuondo Titanum	0.787 0.595 1.170 2.977 74.410 0.787	0.019 0 276 0 787 1.212 42.520 0.019

(6) Cathode Gas Wet Air Pollution Control.

#### PSNS FOR THE PRIMARY AND SECONDARY **TITANIUM SUBCATEGORY**

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (poun pounds) of duced	da per millior Utanium pro
Chromourn (total)	0 228	0.092
Lead	0 228 0.172 0.338	0,092 0.080 0.228
	0.172	0.080
LeadNickel	0.172 0.338	0.080

(7) Chlorine Liquefaction Wet Air Pollution Control.

26464

Titan:um

#### PSNS FOR THE PRIMARY AND SECONDARY TITANIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maxmum for monthly average
	mg/kg (pound pounds) of duced	is per m.T.on ttar.com pro-
Chromium (total)	0.000	0.000
Lead	0.000	0.000
Nickel	0.000	0.000
Thallium	0.000	0.000
	0.000	0 000
Fluoride		0.000

#### (8) Sodium Reduction Container Reconditioning Wash.

#### PSNS FOR THE PRIMARY AND SECONDARY TITANIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
		ds per millen Ittanum pro-

Chromum (total)	0 474	0.192
Lead	0.359	0.167
Nickel	0 705	0.474
Tha!!um	1.795	0.731
Fluende	44.870	25.640
Titan:um	0.474	0.192

#### (9) Chip Crushing Wet Air Pollution Control.

#### PSNS FOR THE PRIMARY AND SECONDARY TITANIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
		ds per millen Manum pro-

Chrom:um (total)	0.000	0.000
Lead	0.000	0.600
Nickel	0.000	0.000
Thallium	0.000	0.000
Fluonde	0.000	630.0
Titan:um	0 0 0 0	0 0 0 0

#### (10) Acid Leachate and Rinse Water.

#### PSNS FOR THE PRIMARY AND SECONDARY TITANIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 d3y	Maximum for mentity average
	mg/kg (pound pounds) of duced	is per milion titanum pro-
Chromum (total)	4.331	1.776
Lead	3.315	1.533
Nickel	6.512	4.331
Tha!!um	16.530	6.749
Fluoride	414.400	236.890

(11) Sponge Crushing and Screening Wet Air Pollution Control.

#### PSNS FOR THE PRIMARY AND SECONDARY TITANIUM SUBCATEGORY

Pollutant or pollutant property	Martin Israny 1 Gy	Mai tarn fer ransdy svorogo
	mg/kg (pour	
	dracq	1777722 220-
Chromhun (tetal)		0000
	dured	
LC3d	bond 0000	0000
Lcad	tond 0000	0000 0000
Chroncism (tetc) Lead Netcl The Sum	tonub (0000 (0000 (0000	0000 0000 0000

#### (12) Acid Pickle and Wash Water.

PSNS FOR THE PRIMARY SECONDARY TITANIUM SUBCATEGORY

Pellutant or pellutant property	Maxmum for ony 1 day	געברביים אין
	rig ( ) (C pounts) of ''	
Chromeum (1012)	0.023	0.000
Lead	0 017	0003
Nakel	0 034	0 003
Tha''um	0 035	0 035
Fluendo	2 125	1220

(13) Scrap Milling Wet Air Pollution Control.

0.003

#### PSNS FOR THE PRIMARY SECONDARY TITANIUM SUBCATEGORY

Pollutant or pallulant property	Mar ram far cry 1 day	May 7377 Ist 75737. BY07030
	mg 7g (soun poundo) of :	
Chromum (toto) Load Nokol Thai'um Fluendo Thanum	6000 000 000 000 000 6000 000 000	0 000 0 000 0 000 0 000 0 000 0 000

#### (14) Scrap Detergent Wash Water.

PSNS FOR THE PRIMARY SECONDARY TITAMUM SUECATEGORY

Pollutant or pollutant property	Maximum far eny 1 day	אמנידיניזי לכד הבידטאי בעכוביבי
		ds por millon area weshed
Chromeum (tota)	6 6 34	2710
Lc3d	5053	23:3
N stcl	9 9 9 2 5	6.034
Tha!'um	<b>1523</b> 9	10000
Fluendo	632330	CS1213
Titasum	6.634	2710

(15) Casting Crucible Wash Water.

#### PSNS FOR THE PRIMARY SECONDARY TITAMUM SUSCATEGORY

Pollutant or pallutant property	Nacimum for any 1 day	Macmum for moribly average
	mg/kg (pounds per million pounds) of Lianum cast	
Oversen (1912)	0.177	0.072
Lest	0.134	0.062
Kitkel	0.262	0177
Tra	0.663	0.272
Filtr.10	16.700	9.540
T12727	0.177	0.072
		1

### (16) Casting Contact Cooling Water.

PSNS FOR THE PRIMARY SECONDARY TITANIUM SUBCATEGORY

Poliziani er poliziani property	Maximum for any 1 day	Maximum for thorship avoroge
	mg/kg (pounds per muler pounds) of thenum cent	
Chroman (Istal)	27.000	10.350
Lest	20.430	9.457
1.2cl	40.140	. 27.000
Trofferm	132568	41 600

2,554,000

27.000

1,459,000

10,550

#### § 421.307 [Reserved]

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0 003

#### Subpart AE—Secondary Tungsten and **Cobalt Subcategory**

§ 421.310 Applicability: Description of the secondary tungsten and cobait subcategory.

The provisions of this subpart are applicable to discharges resulting from the production of tungsten or cobalt at secondary tungsten and cobalt facilities processing tungsten or tungsten carbide scrap raw materials.

#### § 421.311 Specialized definitions.

For the purpose of this subpart the general definitions, abbreviations, and methods of analysis set forth in 40 CFR Part 401 shall apply to this subpart.

§ 421.312 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available.

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

(1) Tungsten Detergent Wash and Rinse.

#### 26466 BPT LIMITATIONS FOR THE SECONDARY TUNGSTEN AND COBALT SUBCATEGORY Maximum Maximum for monthly Pollutant or pollutant property for any 1 day average mg/kg (pounds per million pounds) of tungsten scrap washed 0.371 0.195 Copper. 0.374 26.020 0.248 Nickel Ammonia (as N). Cobalt 0.041 0.018 Oil and Grease. 3,900 Copper. Nickel... 2,340 Total suspended solids 7.995 3.803 DH. (1) (<sup>1</sup>) Ammon Cobalt ... <sup>1</sup> Within the range of 7.5 to 10.0 at all times. Oil and Total su pH. (2) Tungsten Leaching Acid. BPT LIMITATIONS FOR THE SECONDARY TUNGSTEN AND COBALT SUBCATEGORY Maximum for any 1 day Maximum for monthly average Pollutant or pollutant property mg/kg (pounds per million pounds) of tungsten pro-duced r 4.885 2.571 Copper Nickel. 3.265 4.937 Ammonia (as N). 150.600 343,100 0.231 Cobalt. 0.540 Oil and Grease 51 420 Total suspended solids. 105.400 50.140 DH ... (<sup>1</sup>) (1) <sup>1</sup> Within the range of 7.5 to 10.0 at all times. (3) Tungsten Post-Leaching Wash and Rinse. BPT LIMITATIONS FOR THE SECONDARY TUNGSTEN AND COBALT.SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (pound pounds) of duced	ds per million tungsten pro-
Conner	9.772	5,143
Copper Nickel	9.875	6.532
Ammonia (as N)	686,400	301.200
Cobalt	1.080	0.463
Oil and Grease	102.900	61.720
Total suspended solids	210.900	100.300
рН	(*)	(1)

<sup>1</sup> Within the range of 7.5 to 10.0 at all times.

(4) Synthetic Scheelite Filtrate.

BPT LIMITATIONS FOR THE SECONDARY TUNGSTEN AND COBALT SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average	
	mg/kg (pounds per million pounds) of synthetic scheelite produced		
Copper	31.660	16.660	
Nickel	31.990	21.160	
Ammonia (as N)	2,223.000	975.800	
Cobalt	3.499	1.500	
Oil and Grease	333.200	200.000	
Total suspended solids	683.100	324,900	
pH	(*)	(')	

<sup>1</sup> Within the range of 7.5 to 10.0 at all times.

#### (5) Tungsten Carbide Leaching Wet Air Pollution Control.

BPT LIMITATIONS FOR THE SECONDARY TUNGSTEN AND COBALT SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average

	mg/kg (poun pounds) of bide scrap	tungsten car-
*****	3.327	1.751
	3.362	2.224
a (as N)	233.700	102.500
	0.368	0,158
Grease	35.020	21.010
uspended solids	71.790	34.150
	(1)	(1)

<sup>1</sup> Within the range of 7.5 to 10.0 at all times.

#### (6) Tungsten Carbide Wash Water.

BPT LIMITATIONS FOR THE SECONDARY TUNGSTEN AND COBALT SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
		ds per million tungsten car- æd
Copper	15.830	8.333
Nicket	16.000	10.580
Ammon:a (as N)	1,112.000	488.100
Cobalt	1.750	0.750
Oil and Grease	166.700	100.000
Total suspended solids	341.700	162.500
nH	(4)	l (*

<sup>1</sup> Within the range of 7.5 to 10.0 at all times.

(7) Cobalt Sudge Leaching Wet Air Pollution Control.

BPT LIMITATIONS FOR THE SECONDARY	
TUNGSTEN AND COBALT SUBCATEGORY	

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average	
	mg/kg (pounds per million pounds) of cobalt pro- duced from cobalt sludge		
Copper	67.990	35.780	
Nickel	68.700	45.440	
Ammonia (as N)	4,775.000	2,095.000	
Cobalt	7.514	3.220	
Oil and Grease	715.600	429.400	
Total suspended solids	1.467.000	697,700	

<sup>1</sup> Within the range of 7.5 to 10.0 at all times.

DH.

(8) Crystallization Decant.

#### BPT LIMITATIONS FOR THE SECONDARY TUNGSTEN AND COBALT SUBCATEGORY

(\*)

(\*)

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (pound	
1	79,140	41.650

#### BPT LIMITATIONS FOR THE SECONDARY TUNG-STEN AND COBALT SUBCATEGORY-Continued

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
Oil and Grease	833,000	499,600
Total suspended solids	1,708 000	812 200
pH	( <sup>1</sup> )	(')

\* Within the range of 7.5 to 10.0 at all times.

#### (9) Acid Wash Decant.

#### BPT LIMITATIONS FOR THE SECONDARY TUNGSTEN AND COBALT SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
		da per million I cebalt pro-
Copper	36.220	19.060
Nickel	36,600	24.210
Ammonia (as N)	2,544 000	1,116 000
Cobalt	4.003	1.710
Oil and Grease	381.300	228 800
Total suspended sol'ds	781.600	371 700

Within the range of 7.5 to 10.0 at all times.

pН

(10) Cobalt Hydroxide Filtrate.

BPT LIMITATIONS FOR THE SECONDARY **TUNGSTEN AND COBALT SUBCATEGORY** 

day avorago	Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly avotago
-------------	---------------------------------	-----------------------------	-----------------------------------

mg/kg		
pound	coball	pro-

(1)

(Ľ)

ş

	00000	
Copper	107.600	56.650
Nickel	108.800	71.940
Ammonia (as N)	7,560.000	3,318,000
Cobalt	11.900	5 098
Oil and Grease	1,133.00	679,800
Total suspended solids	2,323.000	1,105.000
pH	(4)	(I)

\*Within the range of 7.5 to 10.0 at all times.

#### (11) Cobalt Hydroxide Filter Cake Wash.

#### BPT LIMITATIONS FOR THE SECONDARY TUNGSTEN AND COBALT SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (poun pounds) of duced	da per million I cobalt pro-
Copper	207.200	109 100
Nickel	209.400	138 500
Ammonia (as N)	14,550,000	0.385.000
Cobalt	22.900	9.813
Oil and Grease	2,181.000	1,309 000
Total suspended solids	4,471.000	2,126.000
pH	(4)	(4)

Within the range of 7.5 to 10.0 at all times.

§ 421.313 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable.

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

(a) Tungsten Detergent Wash and Rinse.

#### BAT LIMITATIONS FOR THE SECONDARY TUNGSTEN AND COBALT SUBCATEGORY

Vickel       0.107       0.072         Ammona (as N)       26.020       11.420         Cobatt       0.027       0.014         (b) Tungsten Leaching Acid.       BAT LIMITATIONS FOR THE SECONDARY         TUNGSTEN AND COBALT SUBCATEGORY         Pollutant or pollutant property       Maxmum for any 1 down of tungsten pro- duced         Copper			
pounds)         of         tungsten           Scrap washed         0.107         0.172           Anmona (as N)         26.020         0.119           Cobalt         0.007         11.420           Cobalt         0.027         0.014           (b) Tungsten Leaching Acid.         BAT Limitations FOR THE SECONDARY TUNGSTEN AND COBALT SUBCATEGORY           Pollutant or pollutant property         Maxmum         Maxmum for monthly crearge           mg/kg (pounds per m.l.on pounds) of tungsten produced         1.569           Nickel         1.414         0.951           Ammona (as N)         343 100         150.600           Copper         3.281         1.569           Nickel         1.414         0.951           Ammona (as N)         343 100         150.600           Cobalt         0.360         0.180           Cobalt         1.414         343 100           Josobalt         343 100         150.600           Cobalt         0.360         0.180           Cobalt         1.414         343 100           Schalt         1.414         343 100           Maxmum         Maxmum         for monthly graverage           Follower         Maxing for any 1	Pollutant or pollutant property	for any 1	for monthly
Intel:       0.107       0.072         Intel:       0.007       0.014         Ither is a strain of the second and the second an		pounds)	of tungston
Ammona (as N)       28.020       11.420         Cobalt       0.027       0.014         (b) Tungsten Leaching Acid.       BAT LIMITATIONS FOR THE SECONDARY         TUNGSTEN AND COBALT SUBCATEGORY         Pollutant or pollutant property       Maxmum for any 1 downum for any 1 loog downum for any 1 downum for an	Copper	0.250	0.119
Cobatt     0.027     0.014       (b) Tungsten Leaching Acid.       BAT LIMITATIONS FOR THE SECONDARY TUNGSTEN AND COBALT SUBCATEGORY       Pollutant or pollutant property     Maxmum for any 1     Maxmum for monthly crerage       Pollutant or pollutant property     Maxmum for any 1     Maxmum for monthly crerage       Pollutant or pollutant property     Maxmum for any 1     Maxmum for monthly crerage       Maxmum for any 1     Maxmum for monthly crerage       Copper			
BAT LIMITATIONS FOR THE SECONDARY TUNGSTEN AND COBALT SUBCATEGORY Pollutant or pollutant property Maxmum for any 1 for monthly averaga mg/kg (pounds per million pounds) of tungsten pro- duced Copper			
TUNGSTEN AND COBALT SUBCATEGORY         Pollutant or pollutant property       Maxmum for any 1 day       Maxmum for monthly averaga         mg/kg (pounds per million pounds) of tungsten produced       3.291 1.569 1.414 0.951 1.50.600 0.360 0.180       0.360 0.180         Kokel       1.414 0.951 1.50.600 0.360 0.180       0.360 0.180         (c) Tungsten Post-Leaching Wash and Rinse.       BAT LIMITATIONS FOR THE SECONDARY TUNGSTEN AND COBALT SUBCATEGORY         Pollutant or pollutant property       Maxmum for any 1 day 1 da	(b) Tungsten Leach	ıng Acıd.	
Pollutant or pollutant property       for any 1 day       for monthly sveraga         mg/kg (pounds per m.ll.on pounds) of tungsten pro- duced         Copper			
Pollutant or pollutant property       for any 1 day       for monthly sveraga         mg/kg (pounds per m.ll.on pounds) of tungsten pro- duced         Copper			
day     cverage       mg/kg (pounds per m.l.on pounds) of tungsten pro- duced       Copper	Pollutant or pollutant property		
pounds) of turigsten pro- duced         Sopper	Possian or possian property	day	
Nickel       1.414       0.951         Ammona (as N)       343 100       150.600         Cobalt       0.360       0.180         (c) Tungsten Post-Leaching Wash and Rinse.       BAT LIMITATIONS FOR THE SECONDARY TUNGSTEN AND COBALT SUBCATEGORY         Pollutant or pollutant property       Maximum for any 1 day       Maximum for monthly averago         mg/kg (pounds per m2:cn pounds) of tungsten produced       0.583       3.137         Vickel       2.823       1.503         Ammonia (as N)       686.400       301.250		pounds) of	
Ammona (as N)       343 100       150.600         Cobatt       0.550       0.120         (c) Tungsten Post-Leaching Wosh and Rinse.         BAT LIMITATIONS FOR THE SECONDARY TUNGSTEN AND COBALT SUBCATEGORY         Pollutant or pollutant property       Maxmum for any 1 day         mg/kg (pounds per m2 con pounds) of tungsten produced         Copper.       6.583       3.137         Nickel       2.823       1.503         Ammona (as N)       686.400       301.250	Copper		1
Cobait       0.360       0.180         [c] Tungsten Post-Leaching Wash and Rinse.       BAT LIMITATIONS FOR THE SECONDARY TUNGSTEN AND COBALT SUBCATEGORY         Pollutant or pollutant property       Maximum for monthly day         Pollutant or pollutant property       Maximum for monthly day         mg/kg (pounds per million pounds) of tungston produced       0.583         Copper-       6.583       3.137         Nickel       2.823       1.503         Ammona (as N)       686.400       301.250			
Rinse.         BAT LIMITATIONS FOR THE SECONDARY TUNGSTEN AND COBALT SUBCATEGORY         Pollutant or pollutant property       Maxmum for any 1 dsy       Maxmum for monthly grerago         mg/kg (pounds per m2:cn pounds) of tungston pro- duced       mg/kg (pounds per m2:cn pounds) of tungston pro- duced         Copper			
TUNGSTEN AND COBALT SUBCATEGORY       Pollutant or pollutant property     Maxmum for any 1 day     Maxmum for monthly averago       mg/kg (pounds per m2:cn pounds) of turgston pro- duced     mg/kg (pounds per m2:cn pounds) of turgston pro- duced       Copper:     6.583     3.137       Vickel     2.829     1.503       Ammonia (as N)     686.400     301.200		eaching U	Yash and
Pollutant or pollutant property for any 1 for monthly giverago mg/kg (pounds per m2 con pounds) of tungston pro- duced Copper			
pounds) of turigsticn pro- duced           Copper         6.583         3.137           Nickel         2.829         1.503           Ammonia (as N)         695.400         301.250	Pollutant or pollutant property	for any 1	for monthly
Nickel 2.829 1.903 Ammonia (as N)		pounds) of	
Nickel	Copper	6.583	3.137
	Nickel		
	Ammonia (as N)	- 686.400	301.200

	I	A
(1) C	Cabaalita	Filmete

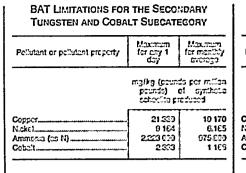
Cobalt.

6

(d) Synthetic Scheelite Filtrate.

0.720

0.360



#### (e) Tungsten Carbide Leaching Wet Air Pollution Control.

#### BAT LIMITATIONS FOR THE SECONDARY TUNGSTEN AND COBALT SUBCATEGORY

Pollutant or pollulant property	Maximum for any 1 day	Maximum for manobly everage
		is per milita tungsten cer- leosked
Copport	0.224 0.026 23.370 0.025	0 107 0005 10250 0012

#### (f) Tungsten Carbide Wash Water.

#### BAT LIMITATIONS FOR THE SECONDARY TUNGSTEN AND COBALT SUBCATEGORY

Pollutant or pollulant property	Maximum fer any 1 day	Maximum for marody evenego
	mg/kg (prum prumás) el balo predut	turigation car-
Copper Netel Armena (cs N) Csbe't	10 670 4.533 1,112 639 1 107	5003 3003 403 100 0503

#### (g) Cobalt Sludge Leaching Wet Air Pollution Control.

BAT LIMITATIONS FOR THE SECONDARY TUNGSTEN AND COBALT SUBCATEGORY

Pollutant or pollutant property	Maxanum far any 1 day	Maximum for monutry everage
		אים איז
Copper	4.500	2103
Nickel	1.953	1.324
Coba't	0.501	0251

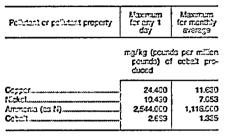
### (h) Crystallization Decant.

#### BAT LIMITATIONS FOR THE SECONDARY TUNGSTEN AND COBALT SUBCATEGORY

Pellutant or pollutant property	Maxmum for any 1 day	Mæurtum for menthly average
	mg/kg (pounds per million pounds) of cobest pro- duced	
	53.310	25.410
Ni ticl	22,910	15.410
Amatana (23 N)	5,559.000	2,433.000
Coto?!	5.831	2.916

#### (i) Acıd Wash Decant.

BAT LIMITATIONS FOR THE SECONDARY TUNGSTEN AND COBALT SUBCATEGORY



#### (j) Cobalt Hydroxide Filtrate.

BAT LIMITATIONS FOR THE SECONDARY TUNGSTEN AND COBALT SUBCATEGORY

Pellutent or pellutent property	Macrum far eny 1 day	Maximum for mentily average	
	mg/kg (pounds per million pounds) of cobait pro- duced		
Ссэрся	72.510 31.160 7.560.000	34.550 20.950 3.316.000	
Cc2c3	7.931	3.985	

#### (k) Cobalt Hydroxide Filter Cake Wash.

BAT LIMITATIONS FOR THE SECONDARY TUNGSTEN AND COBALT SUBCATEGORY

Pellutant or pollutant property	Noomum for any 1 day	Maximum for monitily everage	
		/kg (pounds per million xounds) et ochzit pro hvoed	
Сэрээл Niskel Аттэлэд (эз N) Серэл	133.800 59.970 14,559.000 15.270	65.510 40.240 6,225.000 7,633	

# § 421.314 Standards of performance for new sources.

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Any new source subject to this subpart shall achieve the following new source performance standards:

(a) Tungsten Detergent Wash and Rinse.

#### NSPS FOR THE SECONDARY TUNGSTEN AND COBALT SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
		ds per million of tungsten ed
Соррег	0.250	0.119
Nickel	0.107	0.072
Ammonia (as N)	26.020	11.420
0-h-h	0.027	0.014
	1.950	1.950
Cobalt Oil and Grease Total suspended solids	1.950 2.925	1.950 2.340

<sup>1</sup>Within the range of 7.5 to 10.0 at all times.

#### (b) Tungsten Leaching Acid.

#### NSPS FOR THE SECONDARY TUNGSTEN AND COBALT SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	ma/ka (ooun	ds oer million

pounds) of tungsten produced

_		
Copper	3.291	1.569
Nickel	1.414	0.951
Ammonia (as N)	343.100	150.600
Cobalt	0.360	0.180
Oil and Grease	25.710	25.710
Total suspended solids	38.570	30,850
pH	(9)	(*)
pn		()

<sup>1</sup>Within the range of 7.5 to 10.0 at all times.

(c) Tungsten Post-Leaching Wash and Rinse.

#### NSPS FOR THE SECONDARY TUNGSTEN AND COBALT SUBCATEGORY

Pollutant or pollutant property ~	Maximum for any 1 day	Maximum for monthly average
	mg/kg (pounds per millio pounds) of tungsten pro duced	
Copper	6.583	3.137
Nickel	2.829	1.903
Ammonia (as N)	686.400	301.200
Cobalt	0.720	0.360
Oil and Grease	51.430	51.430
Total suspended solids	77.150	61.720
	(*)	(1)

Within the range of 7.5 to 10.0 at all times.

(d) Synthetic Scheelite Filtrate.

NSPS FOR THE SECONDARY TUNGSTEN AND COBALT SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (poun pounds) scheelite pr	of synthetic
Copper	21.330	10.170
Nickel	9.164	6.165
Ammonia (as N)	2,223.000	975.800
Cobalt	2.333	1.166
Oil and Grease	166.600	166.600
	249.900	200.000
Total suspended solids		

\*Within the range of 7.5 to 10.0 at all times.

#### (e) Tungsten Carbide Leaching Wet Air Pollution Control.

NSPS FOR THE SECONDARY TUNGSTEN AND COBALT SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
---------------------------------	-----------------------------	-----------------------------------

	mg/kg (pounds pounds) of tur bide scrap lea	ngsten car-
Copper	0.224	0,107
Nickel	0.096	0.065
Ammonia (as N)	23.370	10.250
Cobalt	0.025	0.012
Oil and Grease	1.750	1.750
Total suspended solids	2.625	2.100
рН	(*)	(י)

<sup>1</sup> Within the range of 7.5 to 10.0 at all times.

#### (f) Tungsten Carbide Wash Water.

NSPS FOR THE SECONDARY TUNGSTEN AND COBALT SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (pound pounds) of bide produc	tungsten car-
Copper Nickel Armona (as N) Cobalt Oil and Grease Total suspended solids PH	10.670 4.583 1,112.000 1.167 83.330 125.000 (')	5.083 3.083 488.100 0.583 83.330 100.000 ( <sup>1</sup> )

Within the range of 7.5 to 10.0 at all times.

(g) Cobalt Sludge Leaching Wet Air Pollution Control.

#### NSPS FOR THE SECONDARY TUNGSTEN AND COBALT SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
		•

	pounds) o	ds per million I cobalt pro- rom cobalt
Copper	4.580	2.183
Nickel	1.968	1.324
Ammonia (as N)	477.500	209.500
Cobalt	0.501	0.251
Oil and Grease	35.780	35.780
Total suspended solids	53.870	42.940
pH	(י)	(*)

Within the range of 7.5 to 10.0 at all times.

(h) Crystallization Decant.

#### NSPS FOR THE SECONDARY TUNGSTEN AND COBALT SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
,	mg/kg (poun	ds per million
		cobalt pro-
Copper	pounds) of	
Copper Nickel	pounds) of duced	cobalt pro-
	pounds) of duced 53.310	cobalt pro- 25.410

#### NSPS FOR THE SECONDARY TUNGSTEN AND COBALT SUBCATEGORY-Continued

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
Cil and Grease Total suspended solids	624.800	416 500 499 800 (*)

Within the range of 7.5 to 10 0 at all times

#### (i) Acid Wash Decant.

#### NSPS FOR THE SECONDARY TUNGSTEN AND COBALT SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly averago

mg/kgi(po	បរាជន	per	milion
pounds)	of	cobal	t pro-

duced		
Copper	24,400	11 630
Nickel	10 490	7.053
Ammonia (as N)	2,544 000	1,116 000
Cobalt	2.669	1 335
Oil and Grease	190 600	190 600
Total suspended solids	286.000	228 800
pH	(4)	(*)

Within the range of 7.5 to 10.0 at all times.

(j) Cobalt Hydroxide Filtrate.

#### NSPS FOR THE SECONDARY TUNGSTEN AND COBALT SUBCATEGORY

	Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
--	---------------------------------	-----------------------------	-----------------------------------

	mg/kg (pound pounds) of duced	ds por million   cobalt pro-
Сорраг	72.510	34.560
Nickel	31,160	20.960
Ammonia (as N)	7,560,000	3,318,000
Cobalt	7.931	3.985
Oil and Greaso	566.500	560,500
Total suspended solids	849,700	679,600

(1)

(1)

Within the range of 7.5 to 10.0 at all times

DH.

#### (k) Cobalt Hydroxide Filter Cake Wash.

#### NSPS FOR THE SECONDARY TUNGSTEN AND COBALT SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (poun pounds) of duced	da per million I cobalt pro-
Copper	139.600	66 510
Nickel	59 970	40.340
Ammonia (as N)	14,550.000	6,385 000
Cobait	15 270	7.603
Oil and Grease	1,091.000	1,091.000
Total suspended solids	1,636.000	1,309.000
pH	(1)	(1)

Within the range of 7.5 to 10.0 at all times.

#### § 421.315 [Reserved] PSNS FOR THE SECONDARY TUNGSTEN AND PSNS FOR THE SECONDARY TUNGSTEN AND COEALT SUBCATEGORY COBALT SUBCATEGORY § 421.316 Pretreatment standards for new sources. אמנייניניט איניניניט פיניניט Maximum far any 1 day Maximum May min 127 CTY 1 for mentily average Pollutant or pollutant preporty Pellutant or pallutant property Except as provided in 40 CFR 403.7. any new source subject to this subpart mg/kg (pounds per million mg#yg (دوستان من منتقد منتقلام (دوستان) من منتقده منتقده منتقده which introduces pollutants into a prundo) of colait propublicly owned treatment works must comply with 40 CFR Part 403 and Copper Nation 53.310 25 410 21 300 10 170 Correr. achieve the following pretreatment 22.910 0.164 2,223 000 15.410 Nickel. 0.165 Ammana (co N). 5559000 2,439,000 975 010 Ammonia (co fi). standards for new sources. The mass of Catch. 2916 Coba't. 2333 1.169 5.631 wastewater pollutants in secondary tungsten and cobalt process wastewater (i) Acid Wash Decant. introduced into a POTW shall not (e) Tungsten Carbide Leaching Wet exceed the following values: Air Pollution Control. PSNS FOR THE SECONDARY TUNGSTEN AND (a) Tungsten Detergent Wash and COBALT SUBCATEGORY PSNS FOR THE SECONDARY TUNGSTEN AND Rinse: COBALT SUECATEGORY Margan Poliziant or poliziant property PSNS FOR THE SECONDARY TUNGSTEN AND for any 1 for monthly Maximum for marching average for any 1 day\_\_\_\_ COBALT SUBCATEGORY Pollutant or pollutant preparty 0,00010 mg/kg (pounds per million Maximum for any 1 day Maximum for monthly pounds) of cotalt pro-Pollutant or pollutant property m3//g (pounds por milion pounds) of tempoton cor-t do perop loophod everage 24,459 11.630 Correr Nickel mg/kg (pounds per million pounds) of tungston 7.053 10,430 0224 0 107 ATITATA (23 N). 1.116.000 Copper 2 544 000 scrap v ashed tel. 0030 000\$ Catal 2.663 1.335 Ammenia (as N).. 23,370 10,250 0.259 0.119 Copper Cobat 0.029 0.012 0.107 0.072 Nickel (i) Cobalt Hydroxide Filtrate. Ammon:a (as N) 28.020 11.420 0.014 0.027 Cobalt (f) Tungsten Carbide Wash Water. PSNS FOR THE SECONDARY TUNGSTEN AND COBALT SUBCATEGORY PSNS FOR THE SECONDARY TUNGSTEN AND (b) Tungsten Leaching Acid. COBALT SUBCATEGORY Maximum for eny 1 day\_\_\_\_ Maximum for monthly Pellutant or pellutant property PSNS FOR THE SECONDARY TUNGSTEN AND averega Maximum for manually 20.00 COBALT SUBCATEGORY וני בדין 1 בדין Pollutant or pollutant property B-C1213 mg/kg (pounds per millen pounds) of cotail pro-Maximum Махатит for any 1 day Pollutant or pollutant property for monthly deed mgilig (pounds po poundo) of tungs biotopic di bungs ಚಂ ೯೧೫ ಗ್. Сэл everage :n c:::• 72.510 34.560 Coppor 31.160 20,950 mg/kg (pounds per millen T.T.2723 (23 fi)... 7,560.000 3,318.000 pounds) of tungsten pro-duced 10 670 Coppor 5C33 Cabah. 7.931 3 5 8 5 N-1-1 4 633 3003 Ammon.a (cs N) 1,112000 4:3103 1.569 Copper 3,291 Cobolt. 1 107 0.533 Nickel\_ 1.414 0.951 (k) Cobalt Hydroxide Filter Cake Ammonia (as N)\_ 343.100 150.600 Wash. 0.260 Cobalt 0.160 (g) Cobalt Sludge Leaching Wet Air Pollution Control. PSNS FOR THE SECONDARY TUNGSTEN AND (c) Tungsten Post-Leaching Wash and COBALT SUBCATEGORY PSNS FOR THE SECONDARY TUNGSTEN AND Rinse. COBALT SUBCATEGORY Noumen Maximum for mentally Pollutant or pollutant property for cry 1 PSNS FOR THE SECONDARY TUNGSTEN AND averega Махлия Гасалу 1 Фзу Star Mauran far nariðdy Evengo COBALT SUBCATEGORY Pollutant or pollutant property mg/kg (see ands per million poundo) of cobelt pro-duced Maximum for monthly average Maximum Pollutant or pollutant property for any 1 day mgikg (pounds per milion pounds) of cobalt pro-duced from cobalt 139.600 68.510 Coppor Nation 53 970 47.747 mg/kg (pounds per millen na (m ti). 14.550.000 6.335.000 pounds) of tungsten pro-Cabah 15.270 7.633 duced 4500 2.163 Contert Nakel 1993 1324 3.137 Ammonia (os N)... 477.5:3 203.500 Coppe 6.583 NFckel. 2829 1,903 Coha't. 0.501 0.251 §421.317 [Reserved] 636.400 301.200 Ammonia (as N). 0.060 Cobalt 0.720 Subpart AF—Secondary Uranium (h) Crystallization Decant. Subcategory (d) Synthetic Scheelite Filtrate. § 421.320 Applicability: Description of the

secondary uranium subcategory. The provisions of this subpart are applicable to discharges resulting from the production of uranium by secondary uranium facilities.

#### § 421.321 Specialized definitions.

For the purpose of this subpart the general definitions, abbreviations, and methods of analysis set forth in 40 CFR Part 401 shall apply to this subpart.

§ 421.322 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available.

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

(a) Refinery Filtrate.

#### BPT LIMITATIONS FOR THE SECONDARY URANIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (poun pounds) of oxide predu	uranium tri-
Chromium (total)	15.310	6,264
Copper	65.120	34.800
Nickel	66.820	44.200
Ammonia (as N)	4,645.000	2,039.000
Fluoride	1,218.000	696.000
Uran:um	69.600	28.540
Total suspended solids	1,427.000	678.600
pH	(*)	(1)

<sup>1</sup> Within the range of 7.5 to 10.0 at all times.

#### (b) Slag Leach Slurry.

Chromium (total) ..

#### BPT LIMITATIONS FOR THE SECONDARY URANIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
		ds per million Uran:um tri- Iced
Chromium (total) Copper Nickel Armonia (as N) Fluonde Uranium Total succended solids H <sup>1</sup> Within the range of 7.5 to 10	7.220 7.296 507.100 133.000 7.600 155.800 ( <sup>1</sup> )	0.684 3.800 4.826 222.500 76.000 3.116 74.100 ( <sup>1</sup> )
(c) <i>Solvent Extraction</i> BPT Limitations for Uranium Sub	R THE SECO	ſ
Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
••••	mg/kg (pound pounds) of oxide produ	uran.um tri-

2.332

0.954

BPT LIMITATIONS FOR THE SECONDARY **URANIUM SUBCATEGORY**-Continued

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
Copper	10.070	5.300
Nickel	10.180	6.731
Ammonia (as N)	707.200	310,400
Fluoride	185.500	106.000
Uran:um	10.600	4.346
Total suspended solids	217.300	103.400
pH	(')	(4)

<sup>1</sup> Within the range of 7.5 to 10.0 at all times.

(d) Digestion Operation Wet Air Pollution Control.

#### BPT LIMITATIONS FOR THE SECONDARY URANIUM SUBCATEGORY

Pollutant or pollutant property	Maxmum for any 1 day	Maximum for montinly average
---------------------------------	----------------------------	------------------------------------

mg/kg (pounds per mil	
pounds) of uranium	tr⊷
oxide produced	

Chi Coj Nic

Am Flu

Ura

Tot DH

Chrom:um (total)	0.013	0.005
Copper		0.030
Nickel	0.058	0.038
Ammonia (as N)	4.000	1.760
Fluonde	1.050	0.600
Uran:um	0.060	0.025
Total suspended solids	1.230	0.585
pH	(1)	(1)
	-	

Within the range of 7.5 to 10.0 at all times.

#### (e) Evaporation and Calcination Wet Air Pollution Control.

#### BPT LIMITATIONS FOR THE SECONDARY URANIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (peun pounds) of oxide produ	uranum tr-
Chrom:um (total)	0.000	0.000
Copper	0.000	0.000
Nickel	0.000	0.000
Ammonia (as N)	0.000	0.000
Fluoride	0.000	0.000
Uranium	0.000	0.000
Total suspended solids	0.000	0.000
cH	()	()

(f) Hydrogen Reduction and Hydrofluorination KOH Wet Air Pollution Control.

BPT LIMITATIONS FOR THE SECONDARY URANIUM SUBCATEGORY

Poilutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (pounds per million pounds) of uranium te trafluoride produced	
Chromum (total)	0.009	0.004
Copper	0.038	0.020
Nickel	0.038	0.02
Ammonia (as N)	2.670	1.170
Fluonde	0.700	0.40
Uran:um	0.040	0.010

#### BPT LIMITATIONS FOR THE SECONDARY **URANIUM SUBCATEGORY-Continued**

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly averago
рН	()	()
Within the range of 7.5 to 10.0	) at all times.	

#### (g) Hydrofluorination Wet Air Pollution Control.

#### BPT LIMITATIONS FOR THE SECONDARY URANIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly averago

	mg/kg (pounds pounds) of t trailuoride pro	iranium to-
rom:um (total)	0.000	0.000
pper	0.000	0.000
:kel	0.000	0.000
nmonia (as N)	0 000	0 000
ioride	0.000	0.000
anum	0.000	0.000
tal suspended solids	0.000	0 000
	()	()

Within the range of 7.5 to 10.0 at all times.

§ 421.323 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable.

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

(a) Refinery Filtrate.

#### BAT LIMITATIONS FOR THE SECONDARY URANIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (pounds per million pounds) of uranium tri- oxide produced	
Chromum (total) Copper Nicket Ammonia (as N) Fluonde	12 880 44.550 19.140 4,645.000 1,218 000 46.290	\$ 220 21 230 12 880 2,039,000 698,000 19 140

#### (b) Slag Leach Slurry.

#### BAT LIMITATIONS FOR THE SECONDARY URANIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (poun pounds) o oxide prod	ds per million 1 uranium tri- uced
Chromrum (total)	1.406	0 570

#### BAT LIMITATIONS FOR THE SECONDARY **URANIUM SUBCATEGORY-Continued**

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
Copper	4.864	2.318
Nickel	2.030	1.405
Ammonia (as N)	507.100	222.500
Fluoride	133.000	76.000
Uranum	5.054	2.030

#### (c) Solvent Extraction Raffinate.

#### BÂT LIMITATIONS FOR THE SECONDARY URANIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly * average
mg/kg (pounds per millon pounds) of uranum tr- oxide produced		
Chromum (total)	1.961	0.795
Copper Nickel	6.784 2.915	3.233 1.961
Ammonia (as N)	707.200	310,400
Fluoride	185.500	105.000
Uranum	7.049	2.915

#### (d) Digestion Operation Wet Air Pollution Control.

#### BAT LIMITATIONS FOR THE SECONDARY **URANIUM SUBCATEGORY**

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	day	

mg/kg (pounds per million pounds) of uranium tr-

1

_			
Chromum (tota)	0.011	0.005	
Copper	0.038	0.018	
Nickel	0.017	0.011	
Ammonia (as N)	4.000	1.760	
Fluoride	1.050	0.600	
Uran:um	0.040	0.017	

#### (e) Evaporation and Calcination Wet Air Pollution Control.

#### BAT LIMITATIONS FOR THE SECONDARY URANIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly overage
	mg/kg (poun pounds) of	f triancum th

	ongs biogged	
Chromum (total)	0.000	0.000
Copper	0.000	0.000
Nickel	0.000	0.000
Ammon:a (as N)	0.000	0.000
Fluoride	0.000	0.000
Uran:um	0.000	0.000

#### (f) Hydrogen Reduction and Hydrofluorination KOH Wet Air Pollution Control.

#### BAT LIMITATIONS FOR THE SECONDARY URANIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for ony 1 doy	Maximum far manbby evenage
		da por milion I enanum to- moducad
Chromoum (teta') Copper N.ckel Ammon.a (as N) Fluenda	0 637 0 926 0 911 2 670 0 763 0 927	0 003 0 912 0 907 1 170 0 400 0 911

#### (g) Hydrofluorination Wet Air Pollution Control.

#### BAT LIMITATIONS FOR THE SECONDARY URANIUM SUBCATEGORY

Pollutant or pollutant property	Mox.mom fer any 1 day	Maximum for manably excress
		is per milion branum tek mineed
Copper	6000 600 600 600 600 600 600 600 600 60	653 0 653 0 653 0 653 0 653 0 653 0 653 0

#### § 421.324 Standards of performance for new sources.

Any new source subject to this subpart shall achieve the following new source performance standards: (a) Refinery Filtrate.

#### NSPS FOR THE SECONDARY URANIUM SUBCATEGORY

daranan Macanan ar any 1 fer manaly day averago

השליח הכיש בביצורים (הביווים) אליניש איז הענתניש לב (הביווים excip preduced

כוברהבנה (נפובי)	12800	5.220
Copper	44.550	21.223
N.ckcl	19 149	12,830
Ammon:a (as N)	4,045 000	2,033,034
Fluendo	1,218 000	600,003
Uranum	48200	19 149
Total successed at tal da	522(:)	417 600
рН	(1)	- (t)

"Within the range of 7.5 to 100 at all times.

#### (b) Slog Leach Slurry.

#### NSPS FOR THE SECONDARY URANIUM SUBCATEGORY aonan 1 ary 1 day Martin Pollutant or pollutant preparty ter m tere 0.02030 mg/kg (peunds per millen preside) of workers to-exido preduced 0.570 2.318 1406 Chromann (total) 4.854 Copper\_ Nexcl. 2,033 1400 Ammonia (as N). £97.100 222.553

#### NSPS FOR THE SECONDARY URANIUM SUBCATEGORY-Continued

Pellitant er pollstant property	Maximum for eny 1 day	Macmum for monthly average
Filosofo	133.000	76.000
Urenosm	5.054	2030
Tetal suspended self35	57.000	45.600
pH	( <sup>1</sup> )	(')

\*Within the range of 7.5 to 10.0 at all times.

#### (c) Solvent Extraction Raffinate.

#### NSPS FOR THE SECONDARY URANIUM SUBCATEGORY

Pellulari er pallulari proporty	Maximum Isr esy 1 day	Macrann for mentily average
		ás per millen I uranum tr- reed
Chromann (tota) Copper Notel Ammana (to h) Flashdo Vrenam	1.561 6.724 2.915 707.200 185.500 7.043	0.795 3.233 1.561 310.400 106.000 2.915
Total suspended selfda	73.500 (')	63.600 (')

\*Within the range of 7.5 to 10.0 at all times.

#### (d) Digestion Operation Wet Air Pollution Control.

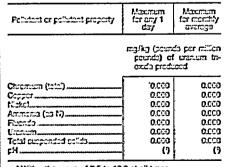
#### NSPS FOR THE SECONDARY URANIUM SUBCATEGORY

Pellitant or pallitant property	Haraman for any 1 day	Maximum for monthly average
		ds per millen I uranum tr- uced
Chromourn (1912)	0.011	0.005 0.018 0.011
N.:240)	4.000	1.760 • 0.600
Ureneen Total suspended selids	0.040	0.017
cH	i e	(9)

Within the range of 7.5 to 10.0 at all times.

#### (e) Evaporation and Calcunation Wet Air Pollution Control.

#### NSPS FOR THE SECONDARY URANIUM SUBCATEGORY



\*Witten the range of 7.5 to 10.0 at all times.

26471

(f) Hydrogen Reduction and Hydrofluorination KOH Wet Air Pollution Control.

#### NSPS FOR THE SECONDARY URANIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (poun pounds) of rafluoride p	uranium tet
Chromum (total)	0.007	0.003
Copper	0.026	0.012
Nickel	0.011	0.007
Ammonia (as N)	2.670	1.170
Fluonde	0.700	0.400
Uranıum	0.027	0.011
	0.000	0.240
Total suspended solids	0.300	I V.244

Within the range of 7.5 to 10.0 at all times.

(g) Hydrofluorination Wet Air Pollution Control.

#### NSPS FOR THE SECONDARY URANIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
,	mg/kg (poun pounds) of rafluoride p	uran:um tet-
Chromium (total) Copper Nickel Armona (as N) Fluoride Uranum Total cucpendad solids pH	0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.009 (')	0.000 0.000 0.000 0.000 0.000 0.000 0.000 ()

<sup>1</sup> Within the range of 7.5 to 10.0 at all times.

#### § 421.325 [Reserved].

# § 421.326 Pretreatment standards for new sources.

Except as provided in 40 CFR 403.7, any new source subject to this subpart which introduces pollutants into a publicly owned treatment works must comply with 40 CFR Part 403 and achieve the following pretreatment standards for new sources. The mass of wastewater pollutants in secondary uranium process wastewater introduced into a POTW shall not exceed the following values:

(a) Refinery Filtrate.

PSNS FOR THE SECONDARY URANIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (pounds per million pounds) of uramum in oxide preduced	
Chrom:um (total)	12.880 44.550	5.220 21:230
Nickcl	19.140	12.680
Ammonia (as N)	4,645.000	2,039.000
Fluoride	1,218.000	636.000

PSNS FOR THE SECC SUBCATEGORY-		
Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
		4

Uranium	46.290	

#### (b) Slag Leach Slurry.

#### PSNS FOR THE SECONDARY URANIUM SUBCATEGORY

19,140

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (poun pounds) of oxedé produ	uran:um tri-
Chromum (total)	1.406	0.570
Copper	4.864	2.318
Nickel	2.090	1.406
	507,100	222.500
Ammonia (as N)	507.100	
Ammonia (as N) Fluoride	133.000	76.000

### (c) Solvent Extraction Raffinate.

PSNS FOR THE SECONDARY URANIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
		ds per million I uran:um tri- iced
Chromrum (total)	1.961	0 795
Copper	6.784	3.233
N.ckel	2.915	1.961
Ammonia (as N)	707.200	310.400
Fluonde	185.500	106.000
Uran:um	7.049	2.915

#### (d) Digestion Operation Wet Aır Pollution Control.

#### PSNS FOR THE SECONDARY URANIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (pound pounds) of oxide produ	uran:um tri-
Chromum (total) Copper Nicket Ammonia (as N) Fluonde Uranaum	0.011 0.038 0.017 4.000 1.050 0.040	0.005 0.018 0 011 1.760 0.600 0 017

(e) Evaporation and Calcination Wet Air Pollution Control.

#### PSNS FOR THE SECONDARY URANIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (pounds per million pounds) of tranium tri- oxido produced	
Chromium (total)	0.000	0 000
Copper	0.000	0 000
Nickel	0.000	0 000
Ammonia (as N)	0 000	0000
Fluoride	0.000	0 000
Uranum	0 000	0,000

#### (f) Hydrogen Raduction and Hydrofluorınation KOH Wet Aır Pollution Control.

#### PSNS FOR THE SECONDARY URANIUM SUBCATEGORY

	Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
--	---------------------------------	-----------------------------	-----------------------------------

mg/kg (pounds per mitton pounds) of uranium te-, tralluoride produced

Chromum (total)	0 007	0 003
Copper	0.026	0 012
N:ckel	0.011	0.007
Ammon:a (as N)	2 670	1,170
Fluondo		0 400
Uran:um	0.027	0.011

#### (g) Hydrofluorination Wet Air Pollution Control.

#### PSNS FOR THE SECONDARY URANIUM SUBCATEGORY

day avotago	Pollutant or pollutant property	for any 1	Maximum fot monthly avotage

mg/kg (pounds per million pounds) of uranium totrafluorido produced

*		
Chromum (total)	0.000	0 000
Coppor	0.000	0 000
Nickel	0.000	0.000
Ammonia (as N)	0 000	0 000
Fluorido	0 000	0 000
Uranum	0.000	0 000

#### § 421.327 [Reserved]

#### Subpart AG—Primary Zirconium and Hafnium Subcategory

§ 421.330 Applicability: Description of the primary zirconium and hafnium subcategory.

The provisions of this subpart are applicable to discharges resulting from the production of zirconium or hafnium at primary zirconium and hafnium facilities.

There are two levels of BPT, BAT, NSPS, PSES and PSNS provisions for this subpart. Level A is applicable to facilities which only produce zirconium or zirconium/nickel alloys by magnesium reduction of zirconium

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BPT LIMITATIONS FOR THE PRIMARY

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dioxide. Level B is applicable to all other facilities.

#### § 421.331 Specialized definitions.

For the purpose of this subpart the general definitions, abbreviations, and methods of analysis set forth in 40 CFR Part 401 shall apply to this subpart.

§ 421.332 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available.

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

(a) Level A.

[1] Acid Leachate (Zirconium Metal Production).

BPT LIMITATIONS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maxmum for monthly everage
		ds per millon pure zrooni- ed
Chromum (total) Cyarida (total) Lead Nickel Ammonia (as N) Radium 226 <sup>1</sup> Total suspended so <sup>5</sup> ds PH	12.970 8.545 12.380 56.570 3,932.000 634.000 1,203.000 ( <sup>3</sup> )	5.304 3.536 5.893 37.420 1,726.000 353.600 574.600 574.600 (*)

<sup>1</sup>Values in picocunes per kilogram (pc/kg). <sup>2</sup>Within the range of 7.5 to 10.0, at all times.

(2) Acid Leachate (Zirconium Alloy Production).

#### BPT LIMITATIONS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum fer monthly avaraga
		ds per millen of znonium n alloys
Chromium (total)	6.939	2.839
Cyaride (total)	4.574	1.893
Lead	6.624	3.154
N.ckel	30,260	20.030
Ammonia (as N)	2,105.000	923.600
Radium 226 1	473.200	194.600
Total suspended solids	646.600	307.600
рН	_(²)	(*)

<sup>1</sup> Values in procuries per kilogram (pc/kg). <sup>2</sup> Within the range of 7.5 to 10.0 at all times.

(3) Leaching Rinse Water (Zirconium Metal Production).

Pollutant or pollutant property	Maximum for city 1 city	השתאבות לכד הביה ביל ברביהיים
	mgikg (poun poundo) of um produce	Fin zreens
Chrom inn (totin)	25000 17650 24709 110213 7605000 1,760500 1,760500 2,416009 ( <sup>7</sup> )	10,610 7 972 11 739 74 849 3,451 039 787,209 1,140 009 (7)

(4) Leaching Rinse Water (Zirconium Alloy Production).

BPT LIMITATIONS FOR THE FRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or pollutant property	Naximum for any 1 doy	Maximum for mentity average
	mg/kg (poun poundo) ( contained a	:1 ່ ຂະຈະຄະຫ
Chromoum (teth) Oyanida (tath) Lead Nickol Ammonia (as N) Rafum 228 <sup>4</sup> Tetal suspended colida pH	0347 0531 1515 163689 20670 32699 (1)	0 142 0 035 0 153 1 031 4 5 210 0 730 15 230 (7)

\*Values in processions per klopping (palkg). \*Within the range of 7.5 to 100 at all times.

#### (b) Level B.

(1) Sand Drying Wet Air Pollution Control.

BPT LIMITATIONS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for city 1 doy	Maximum far manably avanago
	mgikg (scan pamis) of	
Ctromum (tots) Cyando (tots) Lead Netecl Ammonia (as N) Radum 250 Totsl cursponded celds pH	0 167 0.110 0.159 0.728 59.500 11.370 15.549 (7)	0 563 0.045 0 978 0 491 22,000 4 677 7,001 7,001 (7)

<sup>1</sup>Values in piceaunes per Elegram (polkg), <sup>2</sup>Within the range of 7.5 to 10.0 at all times,

(2) Sand Chlorination Off-Gas Wet Air Pollution Control.

#### BPT LIMITATIONS FOR THE PRIMARY ZIRCONIUM AND HAFMIUM SUBCATEGORY

Pellifierd or pellifierd property	Maximum for eny 1 day	Maximum for monady average
		do per milion I crudo ZrOL
בייבו (בובי)	6.473	2.643
Cyperie (222)	4.257	1.765
Foot	6.173	2.943
12-401	23.250	18,630
Ammonia (23 N)	1,983.000	es1.600
Rodum 226 *	441.400	181.600
Tetal suspondod selido	693,209	228.900
£Н	(*)	(7)

## Values in pression per klassem (pe/kg). W tun the range (p 7.5 to 10.0 at cl time.

(3) Sand Chlorination Area Vent Wet Air Pollution Control.

BPT LIMITATIONS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pellutant or pollutant property	Maximum for any 1 day	Maximum for monthly diverzes
		ds per millen I ande ZrSt.
(ಎಎ) ರ್ಯಾಲ್ಯಾ (ಎಎ)	8.631 5.633	3.531 2.354
	8.239 37.680 2.618.000	3.923 24.910 1.143.000
Ammona (ca K) Redum 200 I Tetal successful solida	£\$3,500 £24,500	242.100
£H	୯୨	୯୨

<sup>1</sup> Values in parameters per klopten (pa/kg).
<sup>2</sup> Water the range to 7.5 to 10.0 at all time.

#### (4) SICI, Purification Wet Aur Pollution Control.

BPT LIMITATIONS FOR THE PRIMARY ZIRCOMUM AND HAFMUM SUBCATEGORY

Maximum for monthly Pellidant or pallidant property for any 1 day EVERCE

## mg/kg (poundo per million poundo) of SiQ, puntied

Cuemum ('s's')	3.806	1.557
Cyando (222)	2503	1.033
Load	3.633	1.730
Nizkel	16.610	10.990
ATTCAL3 (23 16)	1,154.000	506.500
Rutum 228	253.500	106.ECO
Total automated salida	354,700	163.700
FH	(2)	(7)
	-	

<sup>1</sup> Values in processes per klogram (ca/kg). Witten the range to 7.5 to 10.0 at all time.

(5) SiCl. Purification Waste Acid.

BPT LIMITATIONS FOR THE PRIMARY ZIRCOMUM AND HAFMUM SUBCATEGORY

Fellidant or politant property	Maximum lar eny 1 day	Maximum for membly average
		ds per milien 202, punified
೦ ರಾದ್ಯಾವ (ಬಂದಿ) ೧೯೭೯ರಂ (ನಿಲಿತಿ) ೧೯೭೯ರಂ ೧೯೭೯ರಂ	1.593 1.254 1.817 8.304	0.779 0.519_ 0.255 5.433

BPT LIMITATIONS FOR THE PRIMARY ZIRCONI-UM AND HAFNIUM SUBCATEGORY-Continued

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
Ammonia (as N)	577.100	253.300
Radium 226 1	129.800 177.300	53.370 840.340
рН	(2)	(2)

<sup>1</sup> Values in procuries per kilogram (pc/kg). <sup>2</sup> Within the range to 7.5 to 10.0 at all time.

(6) Feed Makeup Wet Air Pollution Control.

BPT LIMITATIONS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (poun pounds) of produced	ds per millior crude ZrCL
Chromium (total)	2.787	1.140
Cyanide (total)	1.837	0.760
Lead	2.660	1.267
Nickel	12.160	8.044
Ammonia (as N)	845.300	370.900
Radium 226 1	190.000	78.160
Total suspended solids	259.700	123.500
pH	(²)	(2)

2 Within the range to 7.5 to 10.0 at all time.

(7) Iron Extraction (MIBK) Steam Stripper Bottoms.

BPT LIMITATIONS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

<b></b>	Maximum	Maximum
Pollutant or pollutant property	for any 1	for monthly
	day	average
	pounds) zi hafn:um pro	ds per million rcon:um, and oduced
Chromium (total)	0.914	0.374
Cyanide (total)	0.602	0.249
Lead	0.872	0.415
Nickel	3.988	2.638
Ammonia (as N)	277.200	121.600
Radium 228 1	62.310	25.630
Total suspendéd solids	85.160	40.500
рН	(2)	(2)

<sup>1</sup> Values in picocuries per kilogram (pc/kg). <sup>2</sup> Within the range to 7.5 to 10.0 at all time.

(8) Zirconium Filtrate.

BPT LIMITATIONS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly everage
	mg/kg (pound pounds) of produced	ds per million of zirconium
Chromium (total) Cyanide (total) Lead Nickel Ammonia (as N) Radium 226 <sup>1</sup> Total suspended solids pH	31.330 20.650 29.900 136.700 9,499.000 2,136.000 2,919.000 (*)	12.820 8.543 14.240 90.410 4,169.000 878.500 1,388.000 ( <sup>2</sup> )

<sup>1</sup> Values in picocunes per kilogram (pc/kg). <sup>2</sup> Within the range of 7.5 to 10.0 at all times.

### (9) Hafnium Filtrate.

**BPT LIMITATIONS FOR THE PRIMARY** ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
		ds per million hafn:um pro-
Chromium (total)	0.000	0.000
Lead	0.000	0.000

	Lead		0.000
İ	Nickel		0.000
	Ammonia (as N)	0.000	0.000
	Radium 226 <sup>1</sup>	0.000	0.000
1	Total suspended solids	0.000	0.000
	рН	(²)	( <sup>2</sup> )

<sup>1</sup> Values in picocuries per kilogram (pc/kg). <sup>2</sup> Within the range of 7.5 to 10.0 at all times.

(10) Calcining Caustic Wet Air Pollution Control.

BPT LIMITATIONS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
---------------------------------	-----------------------------	-----------------------------------

mg/kg (pounds			
pounds) of			
and haln:um produced			

Chromum (total)	7.857	3.214
Cyanide (total)	5.178	2.143
Lead	7.500	3.571
Nickel	34.290	22.680
Ammonia (as N)	2,283.000	1,046.000
Radium 226 <sup>1</sup>	535.700	220.400
Total suspended solids	732.100	348.200
рН	(2)	(2)

<sup>1</sup> Values in picocunes per kilogram (pc/kg). <sup>2</sup> Within the range of 7.5 to 10.0 at all times.

(11) Pure Chlorination Wet Air Pollution Control.

BPT LIMITATIONS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average

	mg/kg (pounds per million pounds) of zirconium and hafnium produced	
Chrom:um (total)	11.580	4.738
Cyanide (total)	7.634	3.159
Lead	11,060	5.265
Nickel	50.540	33,430
Ammonia (as N)	3,512.000	1,541.000

789 700

(2)

1.079.000

324,800

513.300

(2)

<sup>1</sup> Values in picocuries per kilogram (pc/kg). <sup>2</sup> Within the range of 7.5 to 10.0 at all times.

Badium 2261

Total suspended solids

pH.

(12) Reduction Area-Vent Wet Air Pollution Control.

#### BPT LIMITATIONS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (poun pounds) o and hafn.un	muinooniz Îc
-		
Chromium (total)	0.290	0 119
Cyanide (total)	0.191	0 079
Lead	0 276	0,132
Nickel	1.264	0.836
Ammonia (as N)	87.820	38,540
Radium 2261	19,740	8 120
	26,980	12 830
Total suspended solids		

<sup>1</sup> Values in picocuries per kilogram (pc/kg).
<sup>2</sup> Within the range of 7.5 to 10.0 at all times.

(13) Magnesium Recovery Wet Air Pollution Control.

BPT LIMITATIONS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
		do per million of zirconium n produced
Chromium (total)	5,791	2.369
Cyanide (total)	3.817	1.580
Lead	5.528	2.632
Nickel	25.270	16.720
Ammonia (as N)	1,756.000	770.800
Radium 2261	394.900	162.400
Total suspended solids	539.600	258 700
рН	(*)	(*)

<sup>1</sup> Values in picocuries per kilogram (pc/kg). <sup>2</sup> Within the range of 7.5 to 10.0 at all times.

(14) Zirconium Chip Crushing Wet Air Pollution Control.

BPT LIMITATIONS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly avorago
	mg/kg (poun pounds) ( produced	da per million of zirconium
Chromium (total)	0.000	0 000
Cyanide (total)	0.000	0000
Lead	0,000	0 000
Nickel	0.000	0 000
Ammonia (as N)	0.000	0 0 0 0
Radium 226 1	0.000	0 000
Total suspended solids	0.000	0 000
pH	(2)	(8)

<sup>1</sup> Values in picocuries per kilogram (pc/kg), <sup>2</sup> Within the range of 7.5 to 10.0 at all times.

(15) Acıd Leachate (Zirconium Metal Production).

BPT LIMITATIONS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
4	mg/kg (poun pounds) of um pròduce	pure zirconi-
Chromium (total)	12.970	5.304

BPT LIMITATIONS FOR THE PRIMARY ZIRCONI- I UM AND HAFNIUM SUBCATEGORY-Continued

Pollutant or pollutant property	Maximum for any 1 v day	Maximum for monthly average
Cyaride (total)	8.545	3.536
Lead	12.380	5.893
Nickel	56.570	37.420
Ammonia (as N)	3.932.000	1.726.050
Radum 226 <sup>1</sup>	834.000	363.600
Total suspended solids	1,208.000	574.600
PH	(*)	(?)

<sup>1</sup> Values in procuries per kilogram (pc/kg). <sup>2</sup> Within the range of 7.5 to 10.0 at all times.

(16) Acid Leachate (Zirconium Alloy Production).

BPT LIMITATIONS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
-		ds per millon of zreonium n elloys
Chromum (total) Cyaride (total) Lead Nickel Amnona (as N) Radium 226 <sup>1</sup> Total suspended solids pH	6.939 4.574 6.624 30.280 2,105.000 473.200 646.600 ( <sup>2</sup> )	2,833 1,693 3,154 20,030 923,600 194,600 307,600 (?)

(17) Leaching Rinse water (Zirconium Metal Production).

BPT LIMITATIONS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maxmum for monthly average
	mg/kg (poun pounds) of um produce	pure zirconi-
Chromum (total)	25.930	10.610
Cyanide (total)	17.090	7.072
Lead	24.750	11.790
Nickel	113.200	74.849
Ammon:a (as N)	7,865.000	3,451.000
Radium 226 1	1,768.000	727.200
Total suspended solds	2,416.000	1,149.000
	(?)	(2)

<sup>1</sup> Values in procouries per kilogram (pc/kg). <sup>2</sup> Within the range of 7.5 to 10.0 at all times.

(18) Leaching Rinse Water (Zirconium Alloy Production).

BPT LIMITATIONS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly overage	
	mg/kg (pounds per million pounds) of zroonum contained in alloys		
Chromum (total)	0.347	0.142	
Cyanide (total)	0.229	0.035	
Lead	0.331	0.153	
Nickel	1.515	1.002	
Ammonia (as N)	105.300	46.210	
Radium 226 1	23.670	9.736	

BPT LIMITATIONS FOR THE PRIMARY ZIRCONI-UM AND HAFNIUM SUBCATEGORY-Continued

Pollutant or pallutant property	Nacasy 1 Caresy 1 Cary	Maxmum fer menady evenego
Total suspended colds	32353 (7)	15830 (9)

Values in procession per kilogram (pa/kg)
 Within the range of 7.5 to 10.0 at all times.

§ 421.333 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable.

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

(a) Level A.

(1) Acid Leachate (Zirconium Metal Production).

BAT LIMITATIONS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	איניגראיז נאר רובאיז בעריבאין
	malka (main	ta nor m <sup>ar</sup> ta

	נות (ברשים שונים) בערבים שניים ביידים לייינים	לתכנת כתום
Chromun (lot.')	12.970	5024
Cyardo (to':)	0.545	3503
Lead	12000	6.833
N.ckel	£9.570	37,420
Ammon.a (co N)	3,932,033	1,728,009
Rofum 226 1	694.000	253655

Values in piscouries per klogram (pa/kg).

(2) Acid Leachate (Zirconium Alloy Production).

BAT LIMITATIONS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for city 1 day	אמטרישא לכו הבאשאלא בעסופים
		is per milion d' zversum n cityo
Сислачл (tota) Cyando (tota)	6.363 4.574 6.624	2£33 1 €33 3,154
N.ckel Ammon.3 (23 N)	C7227 2,105 C29	20.000 023.000
Red um 228 1	473.200	104 600

Values in processors per kilogram (pa/kg).

(3) Leaching Rinse Water (Zirconium Metal Production).

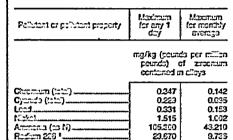
#### BAT LIMITATIONS FOR THE PRIMARY ZIRCONIUM AND HAFMUM SUBCATEGORY

Pellutart or pollutant property	Macrum for ery 1 day	Maximum for monably cvorage
2	mg/kg (pesa pesado) of um preduc	בינים ברכביל-
Cronwen (1912) Crowdo (1912) Lead Katel Amrona (1913) Rofen 266 L	25.500 17.030 24.750 113.200 7,855.000 1,763.000	10.610 7.072 11.730 74.840 3.451.000 727.000

"Volues in passauries per klagram (pe/kg).

(4) Leaching Rinse Water (Zirconium) Alloy Production).

BAT LIMITATIONS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

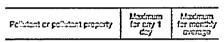


Volues in passanes per klegram (pa/kg).

#### (b) Level B.

(1) Sand Drying Wet Air Pollution Control.

#### BAT LIMITATIONS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY



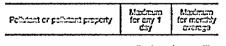
mg/kg (pounds per millen pounds) of zroon cand

		<u> </u>
Cutation (2011)	0.149	0.657
Cyando (tata)	0.076	0.030
Lead	0.108	0.043
Netci	0.209	0.149
ATTER: (23 N)	59,580	22.200
Rotum 203 1	7.551	3.100

"Values in passance per klosten (selkg).

#### (2) Sand Chlorination Off-Gas Wet Air Pollution Control.

#### BAT LIMITATIONS FOR THE PRIMARY ZIRCOMUM AND HAFMUM SUBCATEGORY



ستنجرا ويعاطوهم	المتاجع الاساء	Li mendal i
peundo) c	f ando	- ZrCL
produced		

ດັກເກມະສ (ລາວ) ດັງລະໜ່ວ (ລາວ) ປະກາ	0.554 0.234 0.412	0.221 0.118 0.131
12301	0,203	0.544
A	196.300	86.160
Ration 229 1	29.350	12.030

Values in placation per Elegram (pe/kg).

(3) Sand Chlorination Area Vent Wet Air Pollution Control.

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#### BAT LIMITATIONS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
		ds per million crude ZrCl.
Chromium (total)	0.726	0.294
Cyanide (total)	0.392	0.157
Lead	-0.549	0.255
Nickel	1.079	0.726
Ammonia (as N)	261.800	114.900
Radium 2261	39.140	16.050

Values in picocunes per kilogram (pc/kg).

#### (4) SiCl<sub>4</sub> Purification Wet Air Pollution Control.

BAT LIMITATIONS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
,	mg/kg (poun pounds) of s	
Chromium (total)	0.320	0.130
Cyanido (total)	0.173	0.069
Lead	0.242	0.113
Nickel	0.476	0.320
Ammonia (as N)	115,400	50.650
Radium 2261	17.260	7.076
,		

Values in picocunes per kilogram (pc/kg).

(5) SiCl, Purification Waste Acid.

#### BAT LIMITATIONS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (poun pounds) of s	
Chromium (total)	1.600	0.649
Cyanide (total)	0.865	0.346
Lead	1.211	0.562
Nickel	2.379	1.600
Ammonia (as N)	577.100	253.300
Radium 2261	86.280	35.380
<sup>1</sup> Values in picocunes per kilogr	am (pc/kg).	
(6) Feed Makeup We Control.	et Aır Poli	lution

BAT LIMITATIONS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (poun pounds) of produced	ds per million crude ZrC4
Chromium (total)	0.235	0.095
Cyanide (total)	0.127	0.051
Lead	0.178	0.082
Nickel	0.349	0.235
Ammonia (as N)	84.530	37.090
Radium 2261	12.650	5.186

<sup>a</sup>Values in picocuries per kilogram (pc/kg).

#### (7) Iron Extraction (MIBK) Steam Stripper Bottoms.

BAT LIMITATIONS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (pound pounds) ( and hafn:ur	of zircon:un
		•
Chrom:um (total)	0.769	· · · · · · · · · · · · · · · · · · ·
Chrom:um (total) Cyan:de (total)	0.769 0.415	0.312
Cyan:de (total) Lead	0.769 0.415 0.592	0.312
Cyan:de (total) Lead Nickel	0.415	0.312 0.166 0.270
Cyan:de (total) Lead	0.415 0.582	0.312

<sup>1</sup>Values in picocunes per kilogram (pc/kg).

#### (8) Zirconium Filtrate.

BAT LIMITATIONS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (poun pounds) o produced	ds per million of zirconium
Chromum (total)	26.340	10.680
Cyanide (total)	14.240	5.695
Lead	19.940	9.255
Nickel	39.160	26.340
Ammonia (as N)	9,499.000	4,169,000
rominonia (as iv)		582,400

Values in picocuries per kilogram (pc/kg).

#### (9) Hafnıum Filtrate.

BAT LIMITATIONS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average

mg/kg (pounds per million
pounds) of hafn:um pro-
duced

Ì	Chromium (total)	0.000	0.000
	Cyanide (total)	0.000	0.000
1	Lead	0.000	0.000
	Nickel	0.000	0.000
	Ammonia (as N)	0.000	0.000
	Radium 2261	0.000	0.000

Values in picocunes per kilogram (pc/kg).

(10) Calcining Caustic Wet Air Pollution Control.

BAT LIMITATIONS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	pounds)	ds per million of zurcomum n produced
Chromium (total)	0.661	0.268
Cyanide (total)	0.357	0.143
Lead	0.500	0.232
Nicket	0.982	0.661
Ammonia (as N)	238.300	104.600
Radium 226 <sup>1</sup>	35.630	14.610

Values in picocunes per kilogram (pc/kg).

#### (11) Pure Chlorination Wet Air Pollution Control.

#### BAT LIMITATIONS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (poun pounds) ( and hafniun	mu!noɔuˈs îc

Chromum (total)	0 974	0.395
Cyan:de (total)	0.526	0211
Lead	0,737	0.342
Nickel	1,448	0 974
Ammonia (as N)	351.200	154,100
Radium 2261	52.510	21.530

Values in picocunes per kilogram (pc/kg)

(12) Reduction Area-Vent Wet Air Pollution Control.

#### BAT LIMITATIONS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly averago
	mg/kg (pounds per million pounds) of zirconium produced	
Chrom:um (total)	0.244	0 090
Cyanide (total) Lead	0.132 0.184	0.053
Nicket	0.164	0.086
Ammonia (as N)	87.820	38.540
Radium 2261	13.130	5 303

Values in picocuries per kilogram (pc/kg).

#### (13) Magnessum Recovery Wet Air Pollution Control.

#### BAT LIMITATIONS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly averago	
	mg/kg (pounds per millio pounds) of zirconiur and hainium produced		
Chrom.um (total)		0.197	
Cyanida.(total)	0.263	0.105	
Lead	0.369	0.171	
Nickel	0.724	0.487	
Ammonia (as N)	175.600	77.060	
Radium 2261	26.260	10.770	

<sup>1</sup>Values in picocunes per kilogram (pc/kg).

(14) Zirconium Chip Crushing Wet Air Pollution Control.

#### BAT LIMITATIONS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average	
	mg/kg (pounds por mil pounds) of zircon produced		
Chromum (total) Cyanide (total) Lead Nicket	0.000 0.000 0.000 0.000 0.000	0.000 0.000 0.000 0.000 0.000	

#### BAT LIMITATIONS FOR THE PRIMARY ZIRCONI-UM AND HAFNIUM SUBCATEGORY-Continued

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
Radum 2261	0.000	0.000

<sup>1</sup>Values in picocunes per kilogram (pc/kg).

(15) Acid Leachate (Zirconium Metal Production).

#### BAT LIMITATIONS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day Maximum for menth y averago		
	mg/kg (pounds per million pounds) of pure zuconi- um produced		
Chromum (total)	10.900	4.420	
Cyaride (total)	5.693	2.357	
Lead	8.250	3.831	
Nickel	16.210	10.920	
Ammonia (as N)	3,932.000	1,728.000	
Radium 226 1	587.800	241.000	

<sup>1</sup>Values in picocuries per kilogram (pc/kg).

#### (16) Acid Leachate (Zirconium Alloy Production).

#### BAT LIMITATIONS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
---------------------------------	-----------------------------	-----------------------------------

mg/kg (pounds per million pounds) of zeroenum contained in alloys

		-
Chromum (total)	5.835	2368
Cyanide (total)	3.154	1.262
Lead	4.416	2.050
Nickel	8.674	5.835
Ammonia (as N)	2,105,000	923.600
Radum 226 1	314.700	129.000

Values in procuries per kilogram (pc/kg).

# (17) Leaching Rinse Water (Zirconium Metal Production).

#### BAT LIMITATIONS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maxmum for monthly overego	
	mg/kg (pounds per milion pounds) of pure zirconi- um produced		
Chromum (total) Cyarida (total) Lead. Nickel Ammonia (as N)	21.810 11.790 16.500 32.410 7,865.000 1,176.000	8.649 4.715 7.661 21.810 3,451.099 482,000	

\*Values in p:cocuries per kilogram (pc/kg).

(18) Leaching Rinse Water (Zirconium Alloy Production).

#### BAT LIMITATIONS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pellutant or pollutant property	Maximum far any 1 day	Maximum for manualy evenego	
mg/kg (בכנתוגם במי המושה) בניתוגם (בכנתוגם) בניתוגה או הניתוגם			
Скотчин (toto) Cyardo (toto) Lead Nakol Алтара (co N) Rođun 228 1	0202 0.150 0.221 0.424 165200 15740	0,118 0 C53 0,103 0,292 43,210 0,454	

"Values in placatnes per klagram (pa/kg).

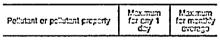
# § 421.334 Standards of performance for new sources.

Any new source subject to this subpart shall achieve the following new source performance standards:

(a) Level A.

(1) Acid Leachate from Zirconium Metal Production.

NSPS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM



	,mg/kg (per peundo) and hoire	ct	zienii
1			

Chromourn (toto)	12.970 8.545 12.333 59.570 3.632.633 694.633 1.639.630	5234 3,533 5,033 37,400 1,720,030 0,37,400 57,4000 574,000
pH	1,273.070	574 000

Values in processies per klegrem (pa/kg).
 Within the range of 7.5 to 100 at all times.

(2) Acid Leachate from Zirconium Alloy Production.

NSPS FOR THE PRIMARY ZIRCOMIUM AND HAFMIUM SUBCATEGORY

Pollutant or pollutant property	fer cry 1 dry	Montanian for manifoly evenega
	m3/kg (55m produced produced	ಜ್ಯಾಂಕ್ ಕಾರ್ಮವಾ ಚಿತ್ರವಾಣಗಳು
Chromann (tota") Cyanido (tota") Lead Netel Ammenia (cs N) Refirm 260 4 Total suspended collas pH	6 0533 4.524 6.624 5.7229 2,105 033 473,203 640,653 (7)	2603 1673 3154 20003 983033 104633 07653 (7)

# Values in piccastics per klostem (pa/kg). Within the range of 7.5 to 10.0 at all times.

(3) Leaching Rinse Water from Zirconium Metal Production.

#### NSPS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pallutant or pallutant property	Maximum for cry 1 for/	Macmum for monthly average
		co per millen puro zreen-
*		
Citeratin (teta)	25.930	10.610
Lead	24.750	11.750
Northel	113.200	74 640
Antrena (03 N)	7.885.000	8,451.000
Rodum 2291	1,763.000	727.200
Total suspended salida	2,416.000	1,143.000
¢Н	-	() ()

Values in pressures per klegram (pa/kg).
 Within the range of 7.5 to 10.0 at all fines.

#### (4) Leaching Rinse Water from Zirconium Alloy Production.

#### NSPS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pellidant or pollidant property	Macmum for any 1 day	Maximum for monthly average
mg/kg (sounds per million pounds) of zeroenum contained in elloys		
Circonum (inin) Cyrrain (inin) Lood Kriski	0.347 0.229 0.331 1.515	0.142 0.035 0.153 1.002
Ammenta (20 N) Radium 2204 Total suspended solids	165.360 23.670 32.350 (*)	45.210 9.735 15.330 (*)

\* Values in passanes per klagram (pa/kg). \* Within the range of 7.5 to 10.0 at all times:

#### (b) Level B.

(1) Sand Drying Wet Air Pollution Control.

#### NSPS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pelliciani er palliciani preperty	Maximum for ony 1 day	Macmum for monthly Evenage
	mg/kg (peun peundo) el	da per million zitten sond
Chreman (1212)	0.142	0.057
C,:::::)	0.078	0.033
Lcat	0.105	0.043
fäsket.	0.253	0.143
ATT TOT (20 M)	50,530	22,200
Refur 2261	7.561	3.100
Total successed salids	5.635	4.543
£H	(7)	

Values in parames per klogram (pa/kg).
 Witten the range of 7.5 to 10.0 dt of times.

#### (2) Sand Chlormation Off-Gas Wet Air Pollution Control.

#### NSPS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (poun pounds) of produced	ds per million crude ZrCL
Chromium (total)	0.544	0.221
Cyanido (total)	0.294	0.118
Lead	0.412	0.191
Nicke!	0.809	0.544
Ammonia (as N)	196.300	86.160
Radium 226 1	29.350	12.030
	22.070	17.650
Total susponded solids		

<sup>1</sup> Values in picocunes per kilogram (pc/kg).
<sup>2</sup> Within the range of 7.5 to 10.0 at all times.

(3) Sand Chlorination Area Vent Wet Air Pollution Control.

#### NSPS FOR THE PRIMARY ZIRONIUM AND HAFNIUM SUBCATEGORY

Pollulant or pollulant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (pound pounds) of produced	ds per millior crude ZrCL
Chromium (total)	0.726	0.294
Cyanide (total)	0.392	0.157
Lead	0.549	0.255
Nickel	1.079	0.726
Ammonia (as N)	261.800	114.900
Hadium 226 •	39.140	16.050
Total sucpended solids	29.430	23.550
	(²)	(2

<sup>1</sup> Values in picocuries per kilogram (pc/kg). <sup>2</sup> Within the range of 7.5 to 10.0 at all times.

(4) SiCl<sub>4</sub> Purification Wet Air Pollution Control.

#### NSPS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
		ds per million SiC4 purified
Chromum (total)	0.320	0.130
Cyanide (total)	0,173	0.069
Lead	0.242	0.113
Nicket	0.476	0.320
Ammonia (as N)	115.400	50.650
Radium 226 *	17.260	7.076
Total suspended solids	12,980	10.380
pH	(²)	(2)

#### NSPS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollulant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (pounds per millior pounds) of SiCl <sub>4</sub> purified	
Chromium (total)	1.600	0.649
Cyanide (total)	0.865	0.346
Nickel	2.379	1.600

NSPS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY-Continued

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
Ammonia (as N)	577.100	253.300
Radium 2261	86.280	35.380
Total suspended solids	64.830	51.900
pH	(1)	(7)

<sup>1</sup> Values in picocuries per kilogram (pc/kg). <sup>2</sup> Within the range of 7.5 to 10.0 at all times.

(6) Feed Makeup Wet Air Pollution Control.

NSPS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Maximum for any 1 day Maximum for monthly Pollutant or pollutant property average. mg/kg (pounds per million pounds) of crude ZrCl<sub>4</sub> produced

95

Chromium (total)	0.235	0.095
Cyanide (total)	0.127	0.051
Lead	0.178	0.082
Nickel		0.235
Ammonia (as N)	84,530	37.090
Radium 226 <sup>1</sup>	12.650	5.186
Total suspended solids	9.510	7.608
pH	(*)	(7)

<sup>1</sup> Values in picocunes per kilogram (pc/kg). <sup>2</sup> Within the range of 7.5 to 10.0 at all times

#### (7) Iron Extraction (MIBK) Steam Stripper Bottoms.

NSPS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	malka laava	de nor million

	pounds) c	pounds) of zirconium and hafnium produced	
Chrom:um (total)		0.312	
Cyanide (total)	0.415	0.166	
Lead	0.582	0.270	
Nickel	1.143	0.769	
Ammon:a (as N)	277.200	121.600	
Radium 226 <sup>3</sup>	41.440	16.990	
Total suspended solids	31.160	24.930	
рН		(7)	

<sup>1</sup> Values in picocunes per kilogram (pc/kg). <sup>2</sup> Within the range of 7.5 to 10.0 at all times.

(8) Zirconium Filtrate.

ł

#### NSPS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	·	

		of zirconium
Chromum (total)	26.340	10.680
Cyanide (total)	.14.240	5.695
Lead	19.940	9.255
Nickel	39.160	26.340
Ammonia (as N)	9,499.000	4,169.000
Radium 2261	1.420.000	582,400
Total suspended solids	1.068.000	854.300
рН	(7)	(*)

<sup>1</sup> Values in picocunes per kilogram (pc/kg). <sup>2</sup> Within the range of 7.5 to 10.0 at all times

### (9) Hafnium Filtrate.

#### NSPS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly averago
	mg/kg (pound pounds) of duced	da per million hainium pro-
Chromum (total)	0.000	0.000
Cyanide (total)	0.000	0.000
Lead	0.000	0.000
Nickel	0.000	0.000
Ammonia (as N)	0.000	0.000
Radium 2261	0.000	0.000
Total suspended solids	0.000	0.000
pH	()	()

<sup>3</sup> Values in picocuries per kilogram (pc/kg). <sup>2</sup> Within the range of 7.5 to 10.0 at all times.

(10) Calcining Caustic Wet Air Pollution Control.

#### NSPS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (pound pounds) (	of zirconium

_		
Chrom:um (total)	0.661	0.269
Cyanido (total)	0.357	0,143
Lead	0.500	0 202
Nickel	0.982	0.601
Ammonia (as N)	238,300	104.600
Radium 2261	35.630	14.610
Total suspended solids	26,790	21.430
рН	(7)	(1)

<sup>1</sup> Values in procuries per kilogram (pc/kg). <sup>2</sup> Within the range of 7.5 to 10.0 at all times.

#### (11) Pure Chlorination Wet Air Pollution Control.

#### NSPS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
---------------------------------	-----------------------------	-----------------------------------

	mg/kg (pounds per million pounds) of zirconium and hainium produced	
Chrom:um (total)	0.974	0.395
Cyanide (total)	0.526	0.211
Lead	0.737	0.342
Nickel	1,448	0.974
Ammonia (as N)	351.200	154,100
Radium 226 1	52.510	21,530
Total suspended solids	39,480	31,690
рН	(9)	(*)

<sup>1</sup> Values in picocuries per kilogram (pc/kg). <sup>2</sup> Within the range of 7.5 to 10.0 at all times.

(12) Reduction Area-Vent Wet Air Pollution Control.

#### NSPS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maxmum for monthly average
	pounds) (	ds per millen of zirconium n produced
Chromum (total)	0.244	0.033
Cyanide (total)		0.053
Lead	0.184	0.028
resa	- V.104	
Nickel	0.362	0.244
Nickel		
	- 0.362 - 87.820	0.244
Nickel Ammonta (as N)	- 0.362 - 87.820 - 13.130	0.244 33.540

\* Within the range of 7.5 to 10.0 at all times.

#### (13) Magnesium Recovery Wet Air Pollution Control.

#### NSPS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for eny 1 day	Maximum for menth'y average
·		ds per million of zaconcum
	divi inductio	a produced
	0.487	0.197
		0.197
Cyanide (total)	0.487	· · · · · · · · · · · · · · · · · · ·
Cyanide (total) Lead	0.487	0.197 0.105 0.171
Cyanide (total) Lead Nickel	0.487 0.263 0.369	0.197 0.105 0.171 0.487
Oranide (total) Lead Nicket Ammon:a (as N)	0.487 0.263 0.369 0.724 175.600	0.197 0.105 0.171 0.487 77.050
Chromum (total) Cyarida (total) Lead. Nicket Ammora (as N)	0.487 0.263 0.369 0.724 175.600	0.197

<sup>1</sup> Values in procuries per kilogram (pc/kg). <sup>2</sup> Within the range of 7.5 to 10.0 at all times.

(14) Zirconium Chip Crushing Wet Air Pollution Cntrol.

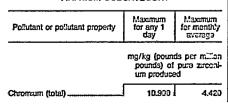
#### NSPS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or pollutant property	Maxamum for any 1 day	Maximum for monthly average
	.mg/kg (poun pounds) ( produced	ds per million of zaconaum
Chromium (total)	0.000	0.050
Cyanide (total)	0.000	0.000
Lead	0.000	0.000
Nickel	0.000	0.000
		0.080
	0.000	0.030
Ammonia (as N) Radium 226 <sup>1</sup>	0.000	0.035
Ammonua (as N)		

<sup>1</sup> Values in picocunes per klogram (pc/kg). <sup>2</sup> Within the range of 7.5 to 10.0 at all times.

(15) Acid Leachate from Zirconium Metal Production.

#### NSPS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY



#### NSPS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY-Continued

Fellutant or pallutant property	Maximum for ony 1 day	Morenian for marcely average
Cyando (teta)	5 833	2.357
Lead	8,259	3.631
Nakel	16,210	10.055
Ammana (as N)	3,032 699	1,720,055
Radum 226 <sup>1</sup>	597 899	241 055
Total suspended cal da	441,899	353.555
pH	(*)	(7)

Values in processes per klastern (colkg)
 Within the range of 7.5 to 100 ct cll times.

(16) Acid Leachate from Zirconium Alloy Production.

#### NSPS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monoby svorogo
	mg/kg (pours poursis) ( conterned to	:1ໍ2:20002277
<b>a</b>		
Chromum (total)	5.835 3.154	2003
Lead	4.416	2053
Nickel	8 674	583
Ammonia (co N)	2,105 000	923 E CO
Redum 226 1	314 700	123 000
Total supponded solida	£2699	160200
сH	(*)	(-)

Velues in processes per kleytern (celkg).
 Within the range of 7.5 to 10.0 at all times.

#### (17) Leaching Rinse Water from Zirconium Metal Production.

#### NSPS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollulant or pollulant property	Maximum for eny 1 day	Maximum for monody average
	mg/kg (poun pounds) cl um preduct	pino zreens
Chromium (tota) Cyanido (tota) Lead Niskol Ammenia (as N) Rođum 226 4 Total suspended colida pH	21.810 11.753 16.553 32.410 7,005.003 1,176.003 634.003 (7)	8840 4715 7631 21.810 3,451.000 402.000 707.000 (7)

\* Values in processors per kuppen (parks). \* Within the range of 7.5 to 10.0 at all bines.

(18) Leaching Rinse Water from Zirconium Alloy Production.

#### NSPS LIMITATIONS FOR THE PRIMARY ZIRCONIUM AND HAFNUIM SUBCATEGORY

Pollutant or pollutant property	Maxmann for ony 1 day	Maxmum for manady svcrogo
	mg/kg (prun prunda) ( contaned b	ป บอกอา
Chromum (totel) Cyanifo (totel) Lead	0.232 0.153 0.221	0,118 0,053 0,163 0,053

45.210

6.454

105.300 15.740

Ammonia (as N).

Radium 226

#### NSPS LIMITATIONS FOR THE PRIMARY ZIRCONI-UM AND HAFNUIM SUBCATEGORY-Continued

Pollutant or pollutant property	Maximum for eny 1 day	Maximum for montaly average
Total suspended sellids pH	11 <i>.8</i> 40 (*)	9.483 (*)
* Values in pressures per kilog	za (re(ka)	

Values in processor per kongrun (perkg).
 \* Wittin the range of 7.5 to 19.0 at all times.

§ 421.335 Pretreatment standards for existing sources.

Except as provided in 40 CFR 403.7 and 403.13, any existing source subject to this subpart which introduces pollutants into a publicly owned treatment works must comply with 40 CFR Part 403 and achieve the following pretreatment standards for existing sources. The mass of wastewater pollutants in primary zirconium and hafnium process wastewater introduced into a POTW must not exceed the following values.

(a) Level A.

(1) Acıd Leachate from Zirconium Metal Production.

#### PSES FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pellutant or pollutant property	Maximum for any 1 day	Maxmum for mentily average

mg/kg (cound	ls per	million
pounds) of	-putn	zacen-
12:53 CC - 14:CC	vet 👘	

Chromum (เวระว)	12.970	5.304
Gyardo (22)	8.545	3.538
Load	12.330	5.833
Kätd	56.570	37.420
ATTTCTC3 (22 N)	3,932.000	1,726.000
Ration 218	834.000	363.600

Valuos in piscourios por klegram (pa/kg).

#### (2) Acid Leachate from Zirconium Alloy Production.

#### PSES FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pellidant or pallidant property	Maamum far any 1 day	Mæcmum for monthly average
		da per millen al zreenum n alloys
වනතාන (කත) වැතැණ (කත) [cod	6.939 4.574 6.624	2833 1.633 3.154
Niekol	30.220 2.105.000	20.030
Radian 228 1	473.209	194.600

\* Values in procurses per klogram (pa/kg).

(3) Leaching Rinse Water from Zirconium Metal Production.

#### PSES FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
		ds per million pure zirconi- ed
Chromlum (total)	25.930	10.610
Cyanide (total)	17.090	7.072
Lead	24.750	11.790
Nickel	113.200	74.840
Ammonia (as N)	7,865.000	3,451.000
Radium 226 1	1,768.000	727.200

<sup>1</sup> Values in picocuries per kilogram (pc/kg).

(4) Leaching Rinse Water from Zirconium Alloy Production.

#### PSES FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
		ids per million of zirconium

	contained in alloys	
Chromium (total)	0.347	0,142
Cyanide (total)	0.229	0.035
Lead	0.331	0,158
Nickel	1.515	1.002
Ammonia (as N)	105.300	46.210
Badium 226 1	23 670	9 736

Values in picocunes per kilogram (pc/kg).

#### (b) Level B.

(1) Sand Drying Wet Air Pollution Control.

#### PSES FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (poun pounds) of	
Chromum (lotal) Cyanide (total) Lead Nicket Ammonia (as N) Radium 226 <sup>1</sup>	0.140 0.076 0.106 0.209 50.580 7.561	0.057 0.030 0.049 0.140 22.200 3.100

Values in picocunes per kilogram (pc/kg).

(2) Sand Chlorination Off-Gas Wet Air Pollution Control.

#### PSES FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (peun pounds) of produced	ds per million crude ZrCL
Chrom:um (total)	0.544	0.221
Cyanide (total)	0.294	0.118
Lead	0.412	0.191
Nickel	0.809	0.554
Ammon:a (as N)	196.300	86.160
	29.350	12.030

Values in picocunes per kilogram (pc/kg).

#### (3) Sand Chlorination Area Vent Wet Air Pollution Control.

PSES FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
		ds per million f crude ZrCL

Chromum (total)	0.726	0.294
Cyanide (total)	0.392	0.157
Lead	0.549	0.255
Nickel	1.079	0.728
Ammonia (as N)	261.800	114,900
Radium 226 1	39,140	16.050

\*Values in picocuries per kilogram (pc/kg),

(4) SiCl<sub>4</sub> Purification Wet Air Pollution Control.

#### PSES FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (poun pounds) of \$	ds per million S:Cl, puniled
Chromum (total)	0.320	0.130
Cyanide (total)	0.173	0,069
Lead	0.242	0.113
Atiokal	0.476	0.320
Nickel		
Ammonia (as N)	115.400	50,650

#### cunes per kilogram (pc/kg)

(5) SiCl, Purification Waste Acid.

#### PSES FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

•			
	Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
•	the second se		

	mg/kg (pound: pounds) of S:	
Chromum (total) Cyanide (total) Lead Nickel Radium 226 <sup>1</sup>	1.600 0.865 1.211 2.379 577.100 86.280	0.649 0.346 0.562 1.600 253.300 35.380

\*Values in picocunes per kilogram (pc/kg).

(6) Feed Makeup Wet Air Pollution Control.

#### PSES FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
49	mg/kg (pounds per millio pounds) of crude ZrC produced	
Chromium (total) Cyanide (total) Lead Nickel Armona (as N) Radium 226 <sup>1</sup>	0.235 0.127 0.178 0.349 84.530 12.650	0.095 0.051 0.032 0.235 37.090 5.186

#### <sup>1</sup> Values in picocunes per kilogram (pc/kg).

#### (7) Iron Extraction (MIBK) Steam Stripper Bottoms.

PSES FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

	Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
--	---------------------------------	-----------------------------	-----------------------------------

	mg/kg (pound pounds) o and hafnium	1 zirconium
Chromium (total)	0,769	0 312
Cyanide (total)	0 415	0 160
Leadt.	0 582	0 270
Nickel	1.143	0 769
Ammonia (as N)	277.200	121 600
Radium 226 1	41,440	10 990

<sup>1</sup> Values in picocuries por kilogram (pc/kg).

#### (8) Zirconium Filtrate.

#### PSES FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollulant or pollutant property	Maximum for any 1 day	Maximum for monthly averago
		da por million of zircenium
Chromum (total)	26.340	10.680
Cyanide (total)	14.240	5 695
Lead	19,940	9 255
Nickel	39,160	20.340
Ammonia (as N)	8,499 000	4,169,000
Radium 226 I	1,420.000	582.400

Values in picocunes per kilogram (pc/kg).

#### (9) Hafnium Filtrate.

#### PSES FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (pounds per mi pounds) of hafn.um j duced	
Chromium (total)	0.000	0 000
Cyanide (total)	0.000	0000
Lead	0.000	0000
Nickelaurania and a second second	0 000	0 000
Ammonia (as N)	0 000	0.000
Radium 226 1	0 000	0 000

<sup>1</sup> Values in picocuries per kilogram (pc/kg)

#### (10) Calcining Caustic Wet Air Pollution Control.

#### PSES FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day mg/kg (pounds per mill: pounds) of zirconiu and hafnium preduced	
Chromium (total)	0.601	0 269
Cyanide (total)	0.357	0 143
Lead	0.500	0.232
Nickel	0.982	0.661
Ammonia (as N)	238.300	104 600
Radium 226 1	35.630	14.610

<sup>1</sup> Values in picocunes per kilogram (pc/kg),

26480

(11) Pure Chlorination	Wet Aır
Pollution Control.	

PSES FOR THE PRIMAI HAFNIUM SUB		im and
Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
•	mg/kg (poun pounds) ( and hain.ur	munoons to
Chromum (total) Cyaride (total) Lead Nickel Ammorca (as N)	0.974 0.528 0.737 1.448 351.200	0.395 0.211 0.342 0.974 154.100
Radium 226 1	52.510	21.530

\* Values in picocunes per kilogram (pc/kg).

#### (12) Reduction Area-Vent Wet Aır Pollution Control.

PSES FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 'day	Maximum for montity everage
		ds per millon of zreonium n produced
Chronnum (total) Cyanide (total) Lead Nickel Ammona (as N) Radium-226 <sup>1</sup>	0.244 0.132 0.184 0.362 87.820 13.130	0.033 0.053 0.026 0.244 33.540 5.333

<sup>1</sup> Values in procuries per kilogram (pc/kg).

(13) Magnesium Recovery Wet Air

Pollution Control.

#### PSES FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Macmum for monthly average
	pounds)	ds per millen of zircomum in produced
Chromum (total)	0.487	-0.197
Cyaride (total)	0.263	0.105
Nickel	0.303	0.437
Ammonia (as N)	175.600	77.030
Radum 226 4	26.260	10.770

\* Values in picocunes per kilogram (pc/kg).

(14) Zirconium Chip Crushing Wet Air Pollution Control.

#### PSES FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (peun pounds) ( produced	ds per millen of zuconlum
Ćhrom:um (total) Oyanide (total) Lead Nickel Ammon:a (as N)	00000 0000 0000 0000 0000 0000	0.000 0.000 0.000 0.000 0.000

#### PSES FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY-Continued

Pollutant or pollutant proporty	Maximum far city 1 day	Maximum for maniphy Excesso
Rofun 226 '	0000	0000

Values in pressures per falogram (po/kg).

(15) Acıd Leachate from Zirconium Metal Production.

PSES FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or pollutant proporty	Maximum for ony 1 day	אמנהשים לכי הכהשיט בינהמיש
	այնից (նշա	to por milion

	poundo) el ( um preduces	
לעיבייס (נכיבי)	10.000	4 420
Cranso (222)	6000	2.357
LCo1	8.259	3 031
Nickel	16.210	10.000
Ammonia (CS N)	3,532,010	1,728000
Rofor 228 *	637,655	241,000

Values in placestes per klagram (salkg).

(16) Acid Leachate from Zirconium Alloy Production.

PSES FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or pollutant property	Maximum far cay 1 day	Maximum fair manaday avanago
	mgikg (poun pounts) (	is per milian al zamanan

	contained in elloyo	
ดีหอสรับท (เช่วะ) Cyart3o (เช่นะ) Lead Netcl Ammonia (co N) ครับมา 223 เ	5.633 3.154 4 416 8.674 2.105.000 314.709	2000 1,002 2,000 6,605 6,605 6,605 1,000

\* Velues in pleesuries per kleyrem (se/kg).

(17) Leaching Rinse Water from Zirconium Metal Production.

PSES FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Petitizant or patitizant property	Maximum for cay 1 cay	Maximum for menticy evenago
	ಗ್ರಾ/ಸ್ಪಿ (೧೦ಬಾ ೧೯೮೫ರು) cf ಜಾ ಭಾರುಜ	prio zreeni-
Chrometa (tote)	21.610	8.040
Oyando (ioto)	11.700	4715
	18.550	7 681
Lcad		
Nickel	\$2,410	21,810
	52.410 7,815.000	21,810 3,451,009

(18) Leaching Rinse Water from Zirconium Alloy Production.

#### PSES FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pellulant or pellulant property	Maximum for eny 1 day	Maximum for monthly average
		is per/millen si zreonum n clicy3
Control (202) Cratic (202) Lead Katal Amatana (22 K) Rodum 22 S <sup>1</sup>	0.232 0.153 0.221 0.434 105.000 15.740	0.118 0.053 0.103 0.252 43.210 6.454

Voluces in presentes per klegrem (pe/kg).

§ 421.336 Pretreatment standards for new sources.

Except as provided in 40 CFR 493.7, any new source subject to this subpart which introduces pollutants into a publicly owned treatment works must comply with 40 CFR Part 403 and achieve the following pretreatment standards for new sources. The mass of wastewater pollutants in primary zirconium and hafmum process wastewater introduced into a POTW shall not exceed the following values:

(a) Level A.

(1) Acid Leachate from Zirconium Metal Production.

PSNS FOR THE PRIMARY ZIRCONIUM AND HAPNIUM SUBCATEGORY

inun	Macmum
ny 1	fer monstay
Sy	average
g (cern	do per millen
más) el	pure zrocn+
preduc	ed
12.970	5.304
8.545	3.535
12.500	5.893
56.570 32.000	37.420 1.726.000 553.600
	ndo) cl produce 12.970 8.545 12.330 56.570

Velues in passanes per kilogram (pe/kg).

(2) Acid Leachate from Zirconium Alloy Production.

#### PSNS FOR THE PRIMARY ZIRCONIUM AND HAFMIUM SUBCATEGORY

Pellidară er polidară property	Maximum for any 1 day	Maximum for monthly overage
	mg/kg (source constance d bonistics	f zrecenzam
Стоплат (222) Султар (222) Lead. Nidel. Аплала (22 N)	6.533 4.574 6.624 50.229 2,105.000 473.200	2.633 1.633 3.154 20.030 623.600 194.600

(3) Leaching Rinse Water from Zirconium Metal Production.

#### PSNS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
		ds per million pure zirconi
	um produce	d
Chromium (total)	um produce 25.930	10.610
Cyanido (total)	· · · · · · · · · · · · · · · · · · ·	
Cyanido (total) Lead	25.930	10.610
Cyanido (total) Lead Nickel	25.930 17.090	10.610 7.072
Cyanido (total) Lead	25.930 17.090 24.750	10.610 7.072 11.790

<sup>1</sup>Values in picocunes per kilogram (pc/kg).

(4) Leaching Rinse Water from Zirconium Alloy Production.

#### PSNS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (poun pounds) o contained it	of zirconium
Chromium (total)	0.347	0.142
Cyanide (total)		0.142
Chromium (total) Cyanide (total) Lead	0.347	

105.300

23.670

\* Values in picocunes per kilogram (pc/kg).

#### (b) Level B.

Ammonia (as N). Radium 226<sup>1</sup>

(1) Sand Drying Wet Air Pollution Control.

#### PSNS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or pollutant property	Mæemum for any 1 day	Maximum for monthly average
		ds per million zircon sand

_		
Chrom:um (total) Cyanide (total) Lead Nickel Ammonia (as N)	0.140 0.076 0.106 0.209	0.057 0.030 0.049 0.140
Radium 226 <sup>1</sup>	50.580 7.561	22.200 3.100

Values in picocunes per kilogram (pc/kg).

(2) Sand Chlorination Off-Gas Wet Air Pollution Control.

#### PSNS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Poilutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (poun pounds) of produced	ds per million cruda ZrCl,
	· · · · · ·	
Chromium (total)	0.544	0.221
Chromium (total) Cyanide (total)	0.544 0.294	
Cyanide (total)		
Cyanide (total) Lead	0.294	0.118 0.191
Chromium (total) Cyanide (total) Lead Nickel Ammonia (as N)	0.294 0.412	0.221 0.118 0.191 0.544 86.160

Values in picocuries per kilogram (pc/kg).

#### (3) Sand Chlorination Area Vent Wet Air Pollution Control.

PSNS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
---------------------------------	-----------------------------	-----------------------------------

		ds per million I crude ZrCL
Chromum (total)	0.726	0.294
Cyanide (total)	0.392	0.157
Lead	0.549	0.255
Nickel	1.079	0.726
Ammonia (as N)	261.800	114.900
Radium 2261	.39.140	16.050

#### \*Values in picocunes per kilogram (pc/kg).

(4) SiCl. Purification Wet Air Pollution Control.

PSNS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Maximum for any 1 day	Maximum for monthly average
	ds per million crude SiCL
0.173	0.130 0.069
0.242 0.476 115.400	0.113 0.320 50.650
17.260	7.078
	for any 1 day mg/kg (poun- pounds) of purified 0.320 0.173 0.242 0.476 115.400

### (5) SiCl, Purification Waste Acid.

PSNS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
---------------------------------	-----------------------------	-----------------------------------

	mg/kg (poun - pounds) of S	
Chromum (total)	1.600	0.649
Cyanide (total)	0.865	0.346
Lead	1.211	0.562
Nickel	2.379	1.600
Ammona (as N)	577.100	253,300
Radium 226 <sup>1</sup>	86.280	35,380

<sup>1</sup>Values in picocunes per kilogram (pc/kg).

(6) Feed Makeup Wet Air Pollution Control.

PSNS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollulant or pollulant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (poun pounds) of produced	ds per millior crude ZrCL
Chromum (total) Cyanide (total) Lead Nickel	0.235 0.127 0.178 0.349 84,530	0.095 0.051 0.082 0.235 37.090
Ammonia (as N)		01.030

(7) Iron Extraction (MIBK) Steam Stripper Bottoms.

PSNS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or Pollutant property	Maximum for any 1 day	Maximum for monthly average

	mg/kg (pound pounds) o and hafnium	i zirconium
Chromium (total)	0.769	0.312
Cyanido (total)	0.415	0.160
Lead	0.582	0.270
Nickel	1,143	0.769
Ammonia (as N)	277.200	121.600
Radium 226 1	41.440	10.990

<sup>1</sup> Value in picocunes per kilogram (pc/kg),

#### (8) Zirconium Filtrate.

#### PSNS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or Pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (poun pounds) ( produced	ds per million of zirconium
Chromum (total)	26.340	10,680
Cyanide (total)	14.240	5.635
Lead	19.940	9.255
Nickel	39,160	20.340
Ammonia (as N)	9,499.000	4,169.000
Radum 226 1	1,420.000	582.400

\* Value in picocuries per kilogram (pc/kg).

#### (9) Hafnium Filtrate.

#### PSNS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or Pollutant property	Maximum for any 1 day	Maximum for monthly average
		ls per million halnium pro-

<sup>1</sup> Value in picocurles per kilogram (pc/kg).

(10) Calcining Caustic Wet Air Pollution Control.

#### PSNS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or Pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (poun pounds) ( and hainlur	of zirconium
Chromium (total) Cyanide (total)	0.681 0.357	0.269 0,143
Lead	0.500	0.232
Nickel	0.982	0.681
Ammonia (as N) Radium 226 <sup>1</sup>	238.300 35.630	104.600 14.010

<sup>1</sup> Value in picocuries per kilogram (pc/kg).

(11) Pure Chlorination Wet Air Pollution Control. PSNS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY Maximum for any 1 day Maximum for monthly Pollutant or Pollutant property averago mg/kg (pounds per million pounds) of zreenum and halnum produced Chromum (total) 0.974 0.395 Cyaride (total)... Lead...... Nickel..... 0.526 0.211 0.737 0.342 Ammon:a (as N). 351.200 154 100 Radum 226 1\_ 52,510 21.530 <sup>1</sup> Value in piccounes per klogram (pc/kg). (12) Reduction Area-Vent Wet Air Pollution Control. PSNS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY Maximum for any 1 day Maximum for monthly average Pollutant or Pollutant property mg/kg (pounds per miller pounds) of ziconium and hafmum produced Chrom:um (total) Cyanide (total).... Lead..... Nickel..... 0.244 0.132 0.093 0.053 0.184 0.038 Ammonia (as N). Radium 2261 87.820 38.540 13.130 5.39 <sup>1</sup> Value in picocunes per kilogram (pc/kg). (13) Magnesium Recovery Wet Air Pollution Control. PSNS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY Maximum Maximum

Роззлатт ог роззлатт рторену	day	average
		is per million of zirconium n produced
Chromum (total)	0.487	0.197
Cyande (total)	0.263	0.105
Lead	0.369	0.171
Nickel	0.724	0.487
Ammonia (as N)	175.600	77.080
Radum 226 1	26.260	10.770

Values in procuries per kilogram (pc/kg).

#### (14) Zirconium Chip Crushing Wet Air Pollution Control.

PSNS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or pollutant preparty	Maximum for chy 1 day	Maximum for mano y averego
	mgikg (prun prundo) ( produced	to per milin di seconomi
Chromum (totz') Cyando (tota') Lead N Stel Amnona (co N) Radum 228 '	0000 0000 0000 0000 0000 0000	C100 C100 C100 C100 C100 C100 C100 C100

Wa'ups in plocouries per klicgram (palkg)

#### (15) Acid Leachate from Zirconium Metal Production.

PSNS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or pallutant preparty	Maximum for ony t day	Maximum far mantidy Everego
		curo zreers
	um pretra:	
Chromum (total)	10.010	4 453
	5.£33	2397
Cyaniza (tota)	دديدي ا	
Lead	0229	3.53
Cyanda (tota) Lead	0150 16210	3.53 10:53
Lead	0229	

Valuos in placatinos por kõogram (pa/ka)

(16) Acid Leachate from Zirconium Alloy Production.

PSNS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pollutant or pollutant proporty	Maximum for any 1 day	אמנהדיים לנו הניגים בנימינים
		is per millen of zerenzen n cilleyo
Chromum (lotal) Cyando (lotal)	5 635 3 154 4 416	2009 1202 2053
N. 5/cl. Ammon.a (co N)	8 674 2,105 C 10 314,720	5.035 023.023 122.023

#### "Veluce in processions per klogram (po/kg)

## (17) Leaching Rinse Water from Zirconium Metal Production.

PSNS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pellutant or pollutant property day
-------------------------------------

mu trancoq tomqo ot tra m3/k3 formqo b		puie zroon-
Charman (1911)	21.810	8.840
Cyanda (1912)	01.790	4.715
Lead	16.500	7.661
Natio	32.410	21.810
Antona (1916)	7,805.000	3.451.00
Refun (2014)	1.176.000	432.650

<sup>1</sup>Values in placation per kliegram (po/kg).

(18) Leaching Rinse Water (Zirconium Alloy Production).

#### PSNS FOR THE PRIMARY ZIRCONIUM AND HAFNIUM SUBCATEGORY

Pellitant or pollutant property	Maximum for eny 1 dey	Maximum for menthly average
	mg/kg (pounds per millen pounds) of zroenum contained in alloys	
Chremium (tatal)	0.232	0.118
C,::::::::::::::::::::::::::::::::::::	0.153	0.063
tistol	0,424	0.292
٨	105.000	49213
Rodum 229 4	15.740	6.454

Walvos in processions per kilogram (pa/kg).

#### § 421.337 [Reserved]

[FR Don 03-1072 Filed 0-20-04:045 am] BILLING CODE COO-SO-M