Federal Register

Wednesday
November 6, 1996

Part II

Environmental Protection Agency

40 CFR Part 455

Pesticide Chemicals Category, Formulating, Packaging and Repackaging Effluent Limitations Guidelines, Pretreatment Standards, and New Source Performance Standards; Final Rule

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 455

[FRL–5630–9]

RIN 2040–AC21

Pesticide Chemicals Category, Formulating, Packaging and Repackaging Effluent Limitations Guidelines, Pretreatment Standards, and New Source Performance Standards

AGENCY: Environmental Protection Agency.

ACTION: Final rule.

SUMMARY: This final regulation limits the discharge of pollutants into navigable waters of the United States and into publicly owned treatment works (POTWs) by existing and new facilities that formulate, package and repackage pesticide products. This regulation covers two subcategories of the Pesticide Chemicals Point Source Category—Subcategory C: Pesticide Formulating, Packaging and Repackaging (PFPR) which includes PFPR facilities that also manufacture pesticide active ingredients (PFPR/Manufacturers) and Subcategory E: Agricultural Refilling Establishments. EPA estimates that there are approximately 2,600 facilities in the industry. This regulation establishes effluent limitations guidelines and standards under the Clean Water Act including ''best conventional pollutant control technology (BCT), and ''best available technology economically achievable (BAT)'' for existing direct dischargers, ''new source performance standards (NSPS)'' for new direct dischargers and ''pretreatment standards for existing and new indirect dischargers (PSES and PSNS)''. This regulation also amends and clarifies the limitations based on ''best practicable control technology (BPT)'' for direct discharging facilities.

Under the final rule refilling establishments (Subcategory E) will be required to achieve zero discharge of wastewater pollutants. The final regulation provides Subcategory C facilities (herein referred to as ''PFPR facilities'') a choice between zero discharge and the ''Pollution Prevention Alternative.'' This compliance alternative was developed in response to comments on the proposed rule from the industry and has received a large amount of industry support in comments on the supplemental notice. This structure provides a compliance option to facilities who agree to implement certain pollution prevention, recycle and reuse practices. Facilities choosing and implementing the pollution prevention alternative will receive a discharge allowance.

The final rule will benefit the environment by removing toxic pollutants (pesticide active ingredients and priority pollutants) from water discharges that have adverse effects on human health and aquatic life. EPA has estimated the compliance costs and economic impacts expected to result from the Zero Discharge/Pollution Prevention Alternative (i.e., Zero/P2 Alternative). The Agency has determined that the Zero/P2 Alternative will result in a similar removal of toxic pound equivalents per year (approximately 7.6 million toxic pound equivalents) as the zero discharge option alone. At the same time, the Zero/P2 Alternative is expected to result in a reduced annualized cost ($29.9 million in 1995), no facility closures and 150 moderate impacts. EPA has determined that both Zero Discharge and the Zero/P2 Alternative are economically achievable. However, EPA's addition of the pollution prevention alternative to achieving zero discharge provides benefits to the environment by minimizing the potential cross-media impacts that would otherwise occur from hauling and incinerating the non-reusable portion of PFPR wastewaters. The provision of an alternative compliance method also provides flexibility to industry in meeting the effluent limitations guidelines and standards.

DATES: This regulation shall become effective January 6, 1997. The information collection requirements contained in this rule are included in two separate Information Collection Request (ICR) documents. The NPDES/Compliance Assessment/Certification ICR (No. 1427.05) and the National Pretreatment Program (40 CFR part 403) ICR (No. 0002.08). OMB has not yet approved these ICRs; therefore, the information collection requirements contained in this rule are not effective until OMB has approved them. Once OMB has approved the ICRs, EPA will publish another notice in the Federal Register to announce OMB's approval and to amend 40 CFR Part 9 to indicate the OMB approval number. The compliance date for §§ 455.46 and 455.66 (PSES) is as soon as possible, but no later than November 6, 1999. The compliance dates for §§ 455.45 and 455.65 (NSPS) and §§ 455.47 and 455.67 (PSNS) are the dates the new sources commence discharging. Deadlines or compliance with §§ 455.42 and 455.62 (BPT), §§ 455.43 and 455.63 (BCT), and §§ 455.44 and 455.64 (BAT) are established in the National Pollutant Discharge Elimination System (NPDES) permits.

ADDRESSES: For additional technical information write to Ms. Shari H. Zuskin, Engineering & Analysis Division (4303), U.S. EPA, 401 M Street SW, Washington, D.C. 20460 or send e-mail to: zuskin.shari@epamail.epa.gov or call at (202) 260–7130. For additional economic information contact Dr. Lynne Tudor at the address above or by calling (202) 260–5834.

The complete record (excluding confidential business information) for this rulemaking is available for review at EPA's Water Docket; 401 M Street, SW, Washington, DC 20460. For access to Docket materials, call (202) 260–3027 between 9 a.m. and 3:30 p.m. for an appointment. The EPA public information regulation (40 CFR part 2) provides that a reasonable fee may be charged for copying.

The Technical Development Document [EPA–821–R–96–019], Economic Analysis [EPA–821–R–96–017] and Cost-Effectiveness Analysis [EPA–821–R–96–018] supporting today's final rule may be obtained by writing to the EPA Office of Water Resource Center (RC–4100), 401 M Street SW., Washington, DC 20460, or calling (202) 260–7786.

FOR FURTHER INFORMATION CONTACT: For additional technical information write or call Ms. Zuskin at (202) 260–7130. For additional information on the economic impact analyses contact Dr. Lynne G. Tudor at the above address or by calling (202) 260–5834.

EPA is preparing a PFPR Pollution Prevention Alternative Guidance Manual and a series of regional workshops to aid industry, permit writers and control authorities in implementing the final rule. A public announcement will be published in Federal Register regarding availability of the guidance manual and the dates and locations of the regional workshops.

SUPPLEMENTARY INFORMATION:

Regulated Entities

Entities potentially regulated by this action are: (1) Those which generate process wastewater from the formulation, packaging and/or repackaging of pesticide products (excluding those pesticide active ingredients not covered by the rule); or (2) those which are agricultural refilling establishments. Regulated categories and entities include:

Category	Examples of regulated entities
Industry	• Pesticide formulating, packaging and repackaging (PFPR) facilities; • PFPR facilities that also manufacture pesticide active ingredients; • Agricultural refilling establishments.

This table is not intended to be exhaustive, but rather provides a guide for readers regarding entities likely to be regulated by this action. This table lists the types of entities that EPA is now aware could potentially be regulated by this action. Other types of entities not listed in the table could also be regulated. To determine whether your facility is regulated by this action, you should carefully examine the applicability criteria in § 455.40 and § 455.60 of the rule. If you have questions regarding the applicability of this action to a particular entity, consult the person listed in the preceding **FOR FURTHER INFORMATION CONTACT** section.

Preamble Outline

I. Legal Authority

This final regulation establishes effluent guidelines and standards of performance for the Pesticide Formulating, Packaging and Repackaging Subcategories of the Pesticide Chemicals Point Source Category under the authorities of sections 301, 304, 306, 307, and 501 of the Clean Water Act (''the Act''), 33 U.S.C. 1311, 1314, 1316, 1317, and 1361.

In accordance with 40 CFR part 23, this regulation shall be considered promulgated for purposes of judicial review at 1 p.m. Eastern time on November 20, 1996. Under section 509(b)(1) of the Act, judicial review of this regulation can be had only by filing a petition for review in the United States Court of Appeals within 120 days after the regulation is considered promulgated for purposes of judicial review. Under section 509 (b)(2) of the Act, the requirements in this regulation may not be challenged later in civil or criminal proceedings brought by EPA to enforce these requirements.

II. Background

A. Clean Water Act

The Federal Water Pollution Control Act Amendments of 1972 established a comprehensive program to ''restore and maintain the chemical, physical, and biological integrity of the Nation's waters,'' (section 101(a)). To implement the Act, EPA is to issue effluent limitations guidelines, pretreatment standards and new source performance standards for industrial dischargers. These guidelines and standards are summarized in the proposed regulation at 59 FR 17850, 17851–52 (April 14, 1994).

Section 304(m) of the Clean Water Act (33 U.S.C. 1314(m)), added by the Water Quality Act of 1987, requires EPA to establish schedules for (1) reviewing and revising existing effluent limitations guidelines and standards (''effluent guidelines''), and (2) promulgating new effluent guidelines. On January 2, 1990, EPA published an Effluent Guidelines Plan (55 FR 80), in which schedules were established for developing new and revised effluent guidelines for several industry categories. One of the industries for which the Agency established a schedule was the Pesticide Chemicals Point Source Category.

Natural Resources Defense Council, Inc. (NRDC) and Public Citizen, Inc.,

challenged the Effluent Guidelines Plan in a suit filed in U.S. District Court for the District of Columbia (*NRDC et al* v. *Reilly,* Civ. No. 89–2980). The plaintiffs charged that EPA's plan did not meet the requirements of sec. 304(m). A Consent Decree in this litigation was entered by the Court on January 31, 1992. The terms of the Consent Decree are reflected in the Effluent Guidelines Plan published on September 8, 1992 (57 FR 41000). This plan states, among other things, that EPA will propose and take final action on effluent guidelines for the formulating, packaging and repackaging subcategories of the pesticide chemicals category by dates certain.

B. The Pollution Prevention Act

The Pollution Prevention Act of 1990 (PPA) (42 U.S.C. 13101 et seq., Pub. L. 101–508, November 5, 1990) ''declares it to be the national policy of the United States that pollution should be prevented or reduced whenever feasible; pollution that cannot be prevented should be recycled in an environmentally safe manner, whenever feasible; pollution that cannot be prevented or recycled should be treated in an environmentally safe manner whenever feasible; and disposal or release into the environment should be employed only as a last resort* * *'' (Sec. 6602; 42 U.S.C. 13101(b). In short, preventing pollution before it is created is preferable to trying to manage, treat or dispose of it after it is created. This effluent guideline was reviewed for its incorporation of pollution prevention as part of this Agency effort.

According to the PPA, source reduction reduces the generation and release of hazardous substances, pollutants, wastes, contaminants or residuals at the source, usually within a process. The term source reduction ''include[s] equipment or technology modifications, process or procedure modifications, reformulation or redesign of products, substitution of raw materials, and improvements in housekeeping, maintenance, training, or inventory control.'' The term ''source reduction'' does not include any practice which alters the physical, chemical, or biological characteristics or the volume of a hazardous substance, pollutant, or contaminant through a process or activity which itself is not integral to or necessary for the production of a product or the providing of a service.'' 42 U.S.C. 13102(5). In effect, source reduction means reducing the amount of a pollutant that enters a waste stream or that is otherwise released into the environment prior to out-of-process recycling, treatment, or disposal.

The PPA directs the Agency to, among other things, ''review regulations of the Agency prior and subsequent to their proposal to determine their effect on source reduction'' (Sec. 6604; 42 U.S.C. 13103(b)(2). This directive led the Agency to implement a pilot project called the Source Reduction Review Project that would facilitate the integration of source reduction in the Agency's regulations, including the technology-based effluent guidelines and standards.

C. Updated Industry Overview

The pesticide formulating, packaging and repackaging industry is made up of two distinct types of activities. These activities result in subcategorization for purposes of this rulemaking. The two subcategories are referred to as:

- Subcategory C: Pesticides formulating, packaging and repackaging (PFPR) including pesticides formulating, packaging and repackaging occurring at pesticides manufacturing facilities (PFPR/Manufacturer) and at stand-alone PFPR facilities; and
- Subcategory E: Repackaging of agricultural chemicals at refilling establishments (Refilling Establishments).

The pesticide formulating, packaging and repackaging industry covered by this rulemaking is made up of an estimated 2,631 in-scope facilities. These facilities are located throughout the country, with greater concentrations of refilling establishments located in the Midwestern and southeastern states to serve the agricultural market.

The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) requires that any substance intended to prevent, destroy, repel or mitigate any pest must be registered with EPA and bear a label directing the safe use of the product. 7 U.S.C. 136a. In addition, production of all pesticide products must be reported annually to EPA. 7 U.S.C. 136e. Thus, EPA has extensive data on the contents of pesticide products, their annual production, who formulates, packages or repackages these products and the uses for which these products are registered. EPA's Office of Water made extensive use of this data in its analysis of the pesticide formulating, packaging and repackaging industry.

Based on 1988 FIFRA establishment registration data, EPA identified the pesticide formulating, packaging, and repackaging facilities in the United States that were using one or more of the active ingredients that were the focus of the Pesticide Manufacturing rulemaking. These pesticide active ingredients are referred to as the ''272 PAIs'' and were the focus of the survey questionnaire for the PFPR rule 1988 data collection.[1] EPA sent out approximately 700 questionnaires using a stratified random sample of these facilities. Based on these survey results, EPA estimates that for all of the PAIs covered by the final rule (in-scope 272 and non-272 PAIs), that in 1988 there were approximately 1,497 facilities involved in formulating, packaging and repackaging pesticide products (of which 413 facilities processed non-272 PAIs only) and approximately 1,134 refilling establishments.[2]

Included in the 1,497 PFPR facilities, there were 48 pesticide manufacturing facilities in the pesticide chemicals manufacturing rulemaking survey database (58 FR 50637, September 28, 1993) that also formulated and packaged pesticide products containing any of the 272 PAIs which were the focus of that rulemaking. A detailed description of the development of this profile is contained in Section 3 of the Technical Development Document [EPA–821–R–96–019] for this final rule.

Pesticide formulating is the mixing/diluting of one or more PAIs with active or inert ingredients, without a chemical reaction, to obtain a manufacturing use or end use product (see § 455.10 of the final regulation for the definitions of formulating, packaging, repackaging and refilling establishment). Pesticide formulations take all forms: Water-based liquid; organic solvent-based liquid; dry products in granular, powder, solid forms; pressurized gases; and aerosols. The formulations can be in a concentrated form requiring dilution before application or can be ready to apply. The packaging of the formulated pesticide product is dependent on the type of formulation. Liquids generally are packaged into jugs, cans, or drums; dry formulations generally are packaged into bags, boxes, drums, or jugs. Pressurized gases are packaged into cylinders. Some formulations are packaged into aerosol cans.

As described above, the formulating, packaging and repackaging industry produces products in different forms. EPA has observed formulating, packaging or repackaging performed a number of different ways ranging from very sophisticated and automated

[1] All remaining pesticide active ingredients are referred to in today's notice as the ''non-272 PAIs.'' In addition, not all non-272 PAIs are in the scope of this rulemaking.

[2] EPA has not re-estimated the number of refilling establishments based on both 272 PAIs and non-272 PAIs because EPA believes that there would not be any refilling establishments that use only non-272 PAIs.

formulation and packaging lines to completely manual lines. In general, for liquid products the process involves mixing the active ingredient with liquid inert ingredients in a tank and then transferring the product to containers. For dry products, the active ingredient may be sprayed in liquid form onto a dry substrate or it may be mixed in dry form. Dry products may undergo processes for mixing, grinding, sifting and finally packaging. The formulating process for aerosol products is the same as for liquid products, but the packaging is more complex and involves filling the container, capping it, drawing a vacuum on the container, adding propellant under pressure, and sealing the container.

Some other types of pesticide products include collars to repel and kill fleas and ticks; pesticides that are micro-encapsulated; and pesticides that are formed into solid shapes.

The pesticide industry is changing and efforts are being made to improve products to meet demands of consumers for less toxic and safer pesticides. For example, water-based solutions are gradually replacing organic solvents in liquid pesticide formulations. Developments in packaging also are underway. For example, the growing use of water soluble packages can reduce worker exposure to pesticides and minimize problems with disposal of packaging.

The refilling establishments represent a newer population of facilities that was identified in the Agency's Survey of Pesticide Producing Establishments. EPA discovered a significant population of facilities that reported repackaging only. These facilities are retail and wholesale dealers of agricultural chemicals and farm supplies. These facilities repackage pesticides, usually herbicides, into refillable containers which are used to transport the pesticide to the site where it is applied.

The use of refillable containers began to grow during the 1980's (and became widespread in the 1990's) to reduce the number of empty pesticide containers needing to be disposed of by farmers. In general, registrants distribute large undivided quantities of pesticides to dealerships (refilling establishments) where the products are stored in large bulk tanks. The dealer then repackages the pesticide from the bulk storage tanks to portable minibulk containers that generally have capacities of about 110 gallons. The increased use of refillable containers led to an increased amount of herbicide stored in bulk quantities and the need to have a secondary containment system built around the bulk storage tanks. Separate from this rulemaking, EPA has proposed a regulation under FIFRA that sets standards for such secondary containment structures (59 FR 6712; February 11, 1994). In addition, many states (22 have/are developing secondary containment regulations) now require secondary containment for bulk pesticide storage and dispensing operations.

D. Final Rule

Today's final rule sets forth an innovative and flexible, yet environmentally protective, approach for the establishment of effluent limitations and pretreatment standards under the Act. For Subcategory C—facilities that formulate, package, or repackage pesticides—EPA is establishing effluent limitations and pretreatment standards which allow each facility to choose to meet a zero discharge limitation or comply with a pollution prevention alternative that authorizes discharge of PAI and priority pollutants after various pollution prevention practices are followed and treatment is conducted as needed (now characterized as the Zero/P2 Alternative option). This rule also establishes a zero discharge limitation and pretreatment standard for agricultural pesticide refilling establishments (Subcategory E).

EPA had originally proposed a zero discharge limitation and pretreatment standard for PFPR facilities. 59 FR 17850 (April 14, 1994). EPA received comment which argued that the proposed zero discharge limitation and pretreatment standard would result in adverse non-water quality environmental impacts and that the scope of the proposed rule should be refined in a variety of ways. Various members of the PFPR community commented that the Agency should adopt a final rule which would require facilities to engage in pollution prevention practices and thereafter discharge de minimis levels of PAI and priority pollutants in the process wastewaters. Upon receiving these comments, EPA published a Supplemental Notice which described the Zero/P2 alternative option in addition to some potential changes in the scope of the rule. 60 FR 30217 (June 8, 1995).

Today's rule adopts the Zero/P2 alternative option for PFPR facilities and changes the scope by reducing the number of PAIs and wastewater sources which are addressed. Under the Zero/P2 option each owner or operator of a PFPR facility in Subcategory C will make an initial choice of whether the facility will meet zero discharge or comply with the P2 Alternative. This choice can be made on a product family/process line/process unit basis rather than a facility wide basis. If the zero discharge option is chosen, the facility owner/operator will need to do whatever is necessary, *e.g.*, wastewater reuse or recycle, either with or without treatment, incineration on-site or haul the wastewater for incineration off-site or underground injection, so that zero discharge of PAIs and priority pollutants in the wastewater is achieved.

If the P2 Alternative portion of the option is chosen for a particular PAI product family/process line/process unit, then the owner/operator of the facility must agree to comply with the P2 practices identified in Table 8 to Part 455 of today's rule for that PFPR family/line/unit. This agreement to comply with the P2 practices and any necessary treatment would be contained in the NPDES permit for direct discharging PFPR facilities or in an individual control mechanism with the control authority, *i.e.*, the POTW, for indirect discharging PFPR facilities (see 403.12(a) for the definition of control authority). In general, PFPR facilities choosing the P2 Alternative need only to submit a small portion of the paperwork to a permitting or control authority (e.g., initial and periodic certification statements). The on-site compliance paperwork is described in Part XII.A.1 of today's notice.

Today's rule changes the scope of the proposed rule in the following ways. First, the rule does not cover PAIs which are sanitizers, including pool chemicals. Also certain liquid chemical sterilants that are used on critical or semi-critical medical devices are not covered. Second, the rule does not apply to PAIs that are microorganisms, such as *Bacillus thuringiensis* (B.t.). Third, the rule does not apply to two groups of PAIs that are mixtures—Group 1 Mixtures include substances which pose no risks and Group 2 Mixtures include substances whose treatment technology has not been identified. Fourth, the pretreatment standards portion of the rule does not apply to one PAI and three priority pollutants which EPA has determined will not pass through or interfere with POTWs. Today's rule also does not cover inorganic wastewater treatment chemicals. With regard to wastewater sources, EPA has decided not to cover storm water at PFPR facilities or at refilling establishments through this rule. In addition, there are a few other wastewater sources such employee showers, on-site laundries, fire equipment test water, eye washes and safety showers, certain Department of Transportation (DOT) aerosol leak test

bath water and laboratory water that are not considered process wastewater under the final rule.

EPA believes that this rule is an important example of how the Agency is re-inventing environmental regulation. The Zero/P2 alternative option being promulgated today is cheaper for the regulated community to comply with than the proposed zero discharge standard. The Zero/P2 alternative option is smarter than the proposed zero discharge standard because it incorporates flexibility in choosing which option is best for a particular product line. The Zero/P2 alternative option is cleaner than the proposed zero discharge standard because the P2 Alternative reduces cross-media impacts to the environment while still achieving, virtually, the same level of pollutant removal from discharges of PFPR process wastewaters (see Section XI for a discussion on the non-water quality impacts associated with the final rule).

E. The Proposed Rule

On April 14, 1994 (59 FR 17850), EPA proposed effluent limitations guidelines and standards for the control of wastewater pollutants from the Pesticide Formulating, Packaging and Repackaging (PFPR) Industry. The proposed rulemaking covered two subcategories. Subcategory C included stand-alone PFPR facilities as well as formulating, packaging and repackaging at pesticide manufacturing facilities (PFPR/Manufacturers). Subcategory E, as proposed, included repackagers of agricultural pesticides at refilling establishments (''refilling establishments''). These proposed guidelines were not intended to apply to the production of pesticide products through an intended chemical reaction (i.e., pesticide manufacturing). (For definitions used in the final rule, see § 455.10 of the final regulation of this notice.) Furthermore, as discussed in Section 1 of the proposal Technical Development Document [EPA–821–R–94–002], Subcategory E (refilling establishments) of these guidelines was not intended to apply to wastewaters generated by custom blending or custom application operations when performed independently or at refilling establishments. The proposed rulemaking would have established a zero discharge limitation for wastewater pollutants from the formulating, packaging and repackaging of almost all pesticide active ingredients for both subcategories covered by this regulation. Only a small number of PAIs were not completely covered by the proposed zero discharge, as a result of disproportionate economic impacts to small facilities.

Due to these impacts, EPA proposed a partial exemption from these guidelines for the exterior wastewaters [3] from small sanitizer facilities. Small sanitizer facilities were defined as those facilities which formulate, package or repackage 265,000 lbs/yr or less of all registered products containing one or more sanitizer active ingredients (listed in Table 8 of the proposed regulation) on sanitizer-only production lines. The production cutoff of 265,000 lbs/yr represents the production level (of these sanitizer products) at the largest facility that would experience economic impacts if there was no exemption for non-interior wastewater sources. (See Section III.A.1 of this notice for a description of revisions made to this exemption).

In addition to the partial exemption given to ''small sanitizers,'' EPA proposed to exempt sodium hypochlorite from coverage under the pretreatment standards for new and existing sources (PSES and PSNS). (See Section III.A.1 of this notice for a description of revisions made to this exemption). EPA also proposed to exempt wastewater generated by on-site employee showers and laundries and from the testing of fire protection equipment from the applicability of these effluent guidelines and standards. In general, these wastewater sources were excluded from the proposed regulation because of worker health and safety concerns. (See Section IX.A of the proposed rule or Section 5 of the Final Technical Development Document (TDD) [EPA–821–R–96–019] for a more detailed discussion of wastewater sources excluded from regulation).

EPA based the proposed zero discharge limitation for Subcategory C on pollution prevention, recycle/reuse and, when necessary, treatment through the Universal Treatment System (UTS) for reuse. EPA visualized the UTS as a flexible system consisting of a variety of treatment technologies that have been determined to be effective for treating PFPR wastewaters. In calculating compliance costs, EPA included costs for various combinations of treatment technologies consisting of emulsion breaking, hydrolysis, chemical oxidation, metals precipitation and carbon adsorption. EPA also included costs for contract hauling treatment residuals (sludges) from the UTS for incineration. Because of the estimates of reduced wastewater volumes based on the increase in reuse/recycle practices, the overall volume of wastewaters being contract hauled off-site for incineration was not expected to increase. Thus, EPA did not include additional costs for contract hauling of PFPR wastewaters in the original proposal. Based on comments, revised costs for the proposed zero discharge option were estimated for the Supplemental Notice (60 FR 30217; June 8, 1995). (See the Final Cost and Loadings Report (September 1996) in the public record for a discussion on the changes to the costing methodology).

EPA based the zero discharge limitation for Subcategory E on reuse of wastewater as makeup water for application to fields, in accordance with the product label.

The subject of the comments on the proposed rule spanned a variety of topics, including changes to the scope of the regulation, EPA's pesticide cross-contamination policy and its effect on the industry's ability to meet zero discharge, increased cross-media impacts due to contract hauling of wastewater for incineration to meet zero discharge, perceived conflicts with the Resource Conservation and Recovery Act (RCRA) requirements, and requests for a discharge allowance when following specific pollution prevention practices. See Section III of today's notice for a summary of the changes that were made to the proposal in response to comment.

F. The Supplemental Notice

In response to many of the comments on the proposed rule, EPA published a supplemental notice (60 FR 30217) in the Federal Register on June 8, 1995. EPA published the Supplemental Notice to obtain public comment on two major topics and several smaller issues. The first major topic for which EPA requested comments was related to the scope and applicability of the rulemaking. Commenters on the proposed rule had requested that EPA exempt certain pesticide active ingredients (PAIs) and certain wastewater sources from the scope of the final rule.

EPA requested comment on expansion of the ''sanitizer exemption'' to exempt additional sanitizer active ingredients, remove the exemption's production limit, and to include both interior and exterior wastewater sources in the revised exemption. EPA also requested comment on the exclusion of some other chemicals including pool chemicals, microorganisms, mixtures

[3] At the time of proposal, exterior wastewaters included: Exterior equipment cleaning water, floor wash, leak and spill cleanup water, safety equipment cleaning water, DOT (Department of Transportation) aerosol test bath water, air pollution control scrubber water, laboratory rinsate and contaminated precipitation runoff.

and pollutants that have been determined to not pass through a POTW. (See Section III.A.1 of today's notice for a discussion of these exemptions; also see Comment Response Document in the public record).

In addition to the exclusion of certain pesticide active ingredients, EPA solicited comment on the partial or full exclusion of certain wastewater sources. These wastewater sources included aerosol leak test bath water, safety equipment cleaning water, laboratory equipment rinse water, and storm water.

The second major topic for which EPA solicited comments was a regulatory option comprised of two alternatives between which industry could choose: (1) Achieving zero discharge or (2) incorporating specific pollution prevention practices and treatment technologies at the facility and allowing a discharge of very small quantities of pollutants. This combined regulatory approach is referred to as the Zero Discharge/Pollution Prevention Alternative (Zero/P2 Alternative).

In particular, the supplemental notice requested comments on the structure of the Zero/P2 Alternative, the extent of best professional judgement (BPJ) allowed, the specific practices included, the modifications allowed and the details of regulatory implementation. Overall, the comments received on the Supplemental Notice were overwhelmingly supportive of the Zero/P2 Alternative. Furthermore, EPA has incorporated many of the suggestions offered in the comments into the Zero/P2 Alternative found in today's notice (see Section XII of today's notice for a discussion of regulatory implementation).

The other issues for which EPA solicited comments in the supplemental notice included: the applicability of the rule to PFPR research and development facilities and stand alone direct discharging facilities, the concentrations found in second and third rinses of a triple rinse, and the expected burden to the permitting authorities.

III. Summary of Most Significant Changes from Proposal

This section describes the most significant changes to the rule since proposal. Many of these changes have resulted from the comments that are discussed in more detail in the Comment Response Document which is contained in the record for this rulemaking. This section will summarize the changes in the rule concerning: The scope of the rule, the addition of the Zero/P2 Alternative, applicability of the rule to research and development facilities, clarification of issues for PFPR/Manufacturers, modification of the existing BPT for direct dischargers, clarification of the definition and applicability for refilling establishments, and RCRA issues.

The major comments received on the supplemental notice are described in detail in the Comment Response Document in the public record. Those comments included: Support for the pollution prevention alternative, requests for self-certification as the method of implementation for the final rule, comments on the specific practices listed in the P2 Alternative, and support for the use of Best Professional or Engineering Judgement (BPJ or BEJ) by the permitting or control authority, respectively.

A. Scope

At the time of proposal, the scope of the rule would have included the formulating, packaging and repackaging of all pesticide active ingredients (with the exception of sodium hypochlorite and the partial exemption of small sanitizers) and a wide variety of associated wastewater sources. Since the proposal, EPA has refined the scope concerning pesticide active ingredients (PAIs) and wastewater sources in response to comments on both the proposed rule and the supplemental notice. The following discussion summarizes these revisions. See the Comment Response Document in the rulemaking record for a more detailed discussion on the changes.

1. Pesticide Active Ingredients (PAIs)

a. Sanitizer Active Ingredients and Pool Chemicals

Several changes have been made to the original ''sanitizer exemption,'' as proposed. In the proposed rule EPA placed small sanitizer facilities in their own subgroup within Subcategory C. However, for the final rule, most sanitizer products have been excluded from Subcategory C (see § 455.10 of the final regulation of today's rule for the definition of sanitizer products). This exclusion is based on a number of factors. The partial exemption for small sanitizer facilities that was included in the proposal was largely based on disproportionate economic impacts. However, based on comments EPA has expanded the sanitizer exemption to include additional chemicals for the following reasons: (1) Sanitizer products are formulated for the purposes of their labeled end use to ''go down the drain;'' (2) sanitizer active ingredients are more likely to be sent to POTWs in greater concentrations and volumes from their labeled end use than from rinsing formulating equipment at the PFPR facility; (3) biodegradation data received with comments on some of these sanitizer active ingredients supports the hypothesis that they do not pass through POTWs; (4) these sanitizer active ingredients represent a large portion of the low toxicity PAIs considered for regulation at the time of proposal; and (5) many sanitizer solutions containing these active ingredients are cleared by the Food & Drug Administration (FDA) as indirect food additives under 21 CFR 178.1010.

The exemption now covers both interior and exterior wastewater sources. In addition, the proposed list of 28 sanitizer active ingredients has been expanded to incorporate the pool chemicals exemption as well as to include home use, institutional and most commercial antimicrobial active ingredients, with the exception of liquid chemical sterilants (including sporicidals), industrial preservatives and water treatment micro biocides other than pool chemicals (as defined in § 455.10 of today's regulation). Certain liquid chemical sterilant products are exempt from today's rule, as discussed in Section III.A.1.c. Furthermore, based on comments, EPA has eliminated the use of a list to define the exempted sanitizer active ingredients and is employing a written definition (see § 455.10 of the final regulation for the definition used in today's final rule).

As mentioned above, EPA has combined the pool chemicals exemption into the sanitizer exemption. This was based on comments on the Supplemental Notice and information gathered in post-proposal site visits (60 FR 30219). EPA believes that a large portion of the pool chemicals that were being reviewed for exemption can and should also be classified as sanitizer active ingredients. In order to avoid possible confusion, EPA has decided to combine these two groups and has incorporated pool chemicals into the definition for sanitizer active ingredients. In addition to this change, the pool chemicals exemption has undergone another refinement. Under the proposed rule, the only pool chemical that was exempt was sodium hypochlorite. Under the final rule, EPA has added several other chemicals to the exemption. These chemicals include calcium hypochlorite, lithium hypochlorite, potassium hypochlorite, chlorinated isocyanurate compounds and halogenated hydantoins. As with the sanitizer chemicals, these chemicals are not exempted via a list, but are instead exempted by definition. See § 455.10 of the final regulation.

b. Other Pesticide Active Ingredients

EPA has excluded several other groups of active ingredients from the final regulation. As discussed in the Supplemental Notice and in the Comment Response Document, microorganisms that are considered PAIs under FIFRA will not be covered by this regulation and will be excluded by definition. Based on the available information on the formulation, packaging and repackaging of such microorganisms and the generation and characteristics of wastewaters from such operations, EPA believes these pesticides are not formulated in a similar fashion as other PAIs covered by this rule. Microorganisms which have registered pesticidal uses are generally created through a fermentation process, similar to those found in some food processing or pharmaceutical plants. Fermentation is a biological process, whereas other pesticides are manufactured and formulated through chemical and physical processes.

In addition, almost all the microorganisms registered as pesticide products are exempt from the requirement of obtaining a (residue) tolerance for pesticides in or on raw agricultural commodities (40 CFR 180.1001). Under Part 180 Subpart D—Exemptions From Tolerance—it states that ''an exemption from a tolerance shall be granted when it appears that the total quantity of the pesticide chemical in or on all raw agricultural commodities for which it is useful under conditions of use currently prevailing or proposed will involve no hazard to the public health.''

EPA has also excluded a group of chemicals, referred to in today's notice as ''Group 1 mixtures.'' This group includes many herbs and spices (e.g., rosemary, thyme, peppermint, cloves...), foods/food constituents, plants/plant extracts (excluding pyrethrins) and many chemicals that are considered to be GRAS (generally recognized as safe) by the Food and Drug Administration as well as those products exempt from FIFRA under 40 CFR 152.25 (61 FR 8876; March 6, 1996)(see § 455.10 of the final regulation of today's notice for the definition of Group 1 mixtures).

There is a second group of mixtures, ''Group 2 mixtures,'' that are being excluded from the regulation. EPA has not been able to transfer treatability data for many of these mixtures because the characteristics that EPA uses for technology transfer are not easily identified (e.g., molecular weights, solubilities and aromaticity). For example, within a given structural group, PAIs that are aromatic, have high molecular weights or low solubility in water have been found to be amenable to activated carbon adsorption. However, when such characteristics cannot be identified, EPA cannot transfer treatability data for carbon adsorption.

EPA previously considered reserving this group of chemicals for regulation at a later time; however, after further research EPA has decided to exclude these chemicals from the scope of the final rule. One reason, as mentioned above, is that the treatability data is insufficient and to obtain treatment performance data on these mixtures would be very difficult due to the inability to transfer data. Also, most of these chemicals in pesticide products are used as inert ingredients rather than active ingredients and the total volume of these mixtures in use in pesticide products is very small (i.e., Group 2 Mixture PAIs only represent approximately eight percent of all of pesticide products). EPA was not able to develop a definition to cover all the chemicals in this group due to the lack of homogeneity between the chemicals. Therefore, Group 2 mixtures will be excluded from the scope of the final rule by list as opposed to definition (see Table 9 to Part 455 of the final regulation).

There are two other groups of chemicals that are being excluded from the final rule: Inorganic wastewater treatment chemicals and chemicals that do not pass through POTWS. Based on comments and data collected for the Treatability Database Report and its Addendum (see the public record for the rulemaking), EPA has decided to exclude, from the scope of the final regulation, inorganic chemicals that are commonly used as wastewater treatment chemicals (e.g., ferric sulfate, potassium permanganate, sulfuric acid, carbon, chlorine, etc...). See Comment Response Document for a discussion on the rationale behind this exclusion. Many of these chemicals are also excluded under the sanitizer/pool chemicals exemption. Again, the use of a definition will be employed to exclude these chemicals. (See § 455.10 of today's final rule for the definition). The four chemicals which are excluded from the pretreatment standards because EPA determined that they do not pass through POTWs are phenol, 2-chlorophenol, 2,4-dichlorophenol and 2,4-dimethylphenol. Phenol, as a constituent in sanitizer products, is excluded from the rule as it was excluded under the proposed sanitizer exemption due to disproportionate economic impacts. See the Comment Response Document in the rulemaking record for a further discussion on the decision to exclude these wastewater treatment chemicals and the chemicals that do not pass through.

c. Liquid Chemical Sterilants

Section 221 of the Food Quality Protection Act of 1996 (Pub. L. 104–170) amended the definition of ''pesticide'' in FIFRA to exclude liquid chemical sterilant products (including any sterilant or subordinate disinfectant claims on such products) which are used on a critical or semi-critical device (as defined in section 201 of the Federal Food, Drug, and Cosmetic Act (''FFDCA'') (21 U.S.C. 321). *See* 7 U.S.C. 136(u), as amended. Because Congress has chosen to exclude such sterilant products from the definition of ''pesticide'', EPA has modified the applicability provisions of this rule so that the effluent limitations and pretreatment standards do not cover the wastewater discharges from the formulation, packaging, and/or repackaging of liquid chemical sterilants for use on critical devices or semi-critical devices as these terms are now defined in FFDCA section 201 and FIFRA section 2(u). See *40* CFR 455.40(f). However, facilities which formulate, package, or repackage products containing liquid chemical sterilants into other types of products, *e.g.*, pesticide products which are *not* used on critical or semi-critical devices introduced directly into the human body, should be aware that the wastewaters resulting from the formulating, packaging, and repackaging activities are covered by this rule.

2. Wastewater Sources

In the proposal, EPA excluded water from on-site employee showers, laundries and testing of fire protection equipment (59 FR 17903). EPA has added several other wastewater sources to the exclusion. These include: Storm water,[4] water used for testing and emergency operation of safety showers and eye washes; DOT leak test bath water from non-continuous overflow baths (i.e., batch baths) where no cans have burst from the time of the last water change out; and water used for cleaning analytical equipment and glassware and for rinsing the retain sample container in on-site laboratories. However, the initial rinse of the retain sample container is considered a process wastewater source for the final regulation. (See the Comment Response

[4] Storm water at PFPR facilities and Refilling Establishments is covered by the Storm water Regulations Phase I and II, respectively.

Document for a discussion on the exclusion of these wastewaters).

B. The Zero Discharge/Pollution Prevention Alternative Option

Commenters submitted a variety of comments which prompted the Agency to consider the Zero/P2 Alternative option. The most significant are summarized below. (See the Comment Response Document in the public record for additional summary of comment responses and responses to individual comments.)

1. Cross Media Impacts and Incineration Issues

Commenters on the proposed rule believe that the zero discharge standard, as proposed, would lead to a large increase in cross-media impacts because the majority of facilities would be forced to contract haul dilute non-reusable wastewaters off-site for incineration (or other off-site disposal). Commenters questioned the goal of achieving zero discharge when it leads to an increase in cross-media impacts.

At the time of the proposed rule, EPA believed that the proposed approach to achieving ''zero discharge'' of wastewater pollutants from PFPR facilities would result in increasing the recycling, reuse and recovery of wastewater pollutants. In addition, EPA based the requirements on the best practices observed at PFPR facilities studied as part of the development of the rule. However, based on the concerns raised by commenters about the potential cross-media impacts EPA decided to seek comment on the pollution prevention (P2) alternative to zero discharge in order to reduce these impacts (60 FR 30217). The P2 Alternative to the zero discharge standard will allow a discharge of wastewater after waste discharge reductions are achieved using certain flow conservation, recycle or reuse and, under certain circumstances, wastewater treatment practices. Should a facility choose to comply with the regulation through the P2 Alternative the need for off-site disposal is reduced; thus, the cross-media effects are reduced.

For those facilities that choose to comply with the final rule by achieving zero discharge, EPA has revised the cost model. The revisions add costs to account for increased volumes of non-reusable wastewaters being contract hauled for off-site incineration (see the Final Cost and Loadings Report (September 1996) for a discussion on changes to the costing methodology). The revised cost estimates for the industry to achieve zero discharge of wastewater pollutants, including the additional contract hauling costs, are still found to be economically achievable for the industry. (See Section V of today's notice for a discussion on the economic achievability of the final regulation.)

Commenters also commented that a significant decrease in incineration capacity and an increased cost would result from EPA's combustion policy which may limit the permitting of new incinerators or the expansion of capacity of existing incinerators. EPA has addressed this concern in two ways. First, through the use of the P2 Alternative to zero discharge, this final rule will allow for the discharge of much of the non-reusable PFPR wastewaters that might otherwise be contract hauled for incineration. Second, as mentioned above, EPA has revised its costing methodology for the zero discharge option to include off-site incineration of these additional non-reusable wastewaters and has still found the rule to be economically achievable by the industry. In addition, EPA does not believe an additional burden will be placed on incineration capacity. This is supported by a survey, ''Hazardous Waste Incineration 1994,'' published in the *EI Digest*, June 1994 which showed that while there is increasing demand for incineration there is still great untapped capacity. The surveyed commercial incinerators believe that market saturation, competition with cement kilns and successful waste minimization efforts by industry account for the unused capacity and the decline in the average price for incineration. [See the memo in the record entitled *Incineration Costs for PFP Facilities*, September 30, 1994.]

2. Cross-Contamination Policy

Commenters also stated that complete reuse, as proposed, is not achievable because of EPA's existing policy on cross-contamination of pesticide products. At the time of proposal EPA was using a standard of zero for cross-contamination. This meant that an active ingredient may not be present at *any* concentration in a FIFRA registered product where it is not listed on the confidential statement of formula (CSF) of that product or reported to EPA as an impurity. During the study phase for the development of the proposal, the industry practice was to triple rinse containers and equipment. Because of recent EPA enforcement actions, industry commented that additional rinsing is being used to comply with the cross-contamination policy.

Commenters believe that more aggressive enforcement of a zero-standard cross-contamination policy would increase wastewater volumes to the point that it would not be feasible to reuse these volumes. The commenters also believe that these factors were not taken into account when the proposed zero discharge regulation was developed. According to commenters, a facility that performs a triple rinse of the equipment interiors when changing from formulating one product to another, may have to perform additional rinses (e.g., a five times rinse) to ensure a level of zero cross-contamination. Commenters stated that even in cases where the rinsate from the ''triple rinse'' could be stored for use in a future formulation, the additional rinses create more rinsewater than could be reused and that these very dilute wastewaters would have to be contract hauled for off-site disposal to achieve zero discharge. Commenters believe this additional contract hauling of wastewater not only makes the proposed regulation economically unachievable, but increases the opportunity for cross-media impacts.

At the time of the supplemental notice EPA was reviewing the pesticide cross-contamination policy. EPA has since published a Notice of Availability on a more risk-based draft policy in the Federal Register for public comment (61 FR 1928; January 24, 1996) and expects publication of the final policy by the end of 1996. In addition, EPA has created the P2 Alternative to zero discharge in this rulemaking which would allow formulators, packagers and repackagers to discharge these dilute non-reusable rinses following the use of specified pollution prevention practices.

3. Request for De Minimis Discharge

Due to the concerns described above, many commenters requested a discharge allowance for these excess or non-reusable wastewaters. Commenters suggested that they would be willing to agree to use specified pollution prevention practices and pointed to the pollution prevention, recycle and reuse practices described in the preamble to the proposal (59 FR 17866) and the technical development document for the proposal [EPA #821–R–94–002]. In some cases commenters provided examples of possible additional practices they would be willing to agree to use. EPA believes that a discharge allowance (''pollution prevention allowable discharge'') may provide an added incentive to increase the use of pollution prevention and recycle practices, while ensuring that facilities are maximizing pollutant reductions in the wastewater while minimizing cross-media effects. Therefore, in response to the request for

a ''de minimis'' discharge alternative, EPA has incorporated the P2 Alternative into the zero discharge standard for the final regulation.

4. Pollution Prevention Alternative

Several changes have been made to the P2 Alternative since it was first presented in the Supplemental Notice. The most significant revision is that a facility will be able to choose between achieving zero discharge or an allowable discharge (using the P2 Alternative) on a product family/process line/process unit basis.

In the supplemental notice, this choice was to be made on a facility wide basis. However, based on comments, EPA believes that the zero/P2 alternative option will be most practical if facilities can choose zero discharge for those processes/process units at their facility that are most amenable to zero discharge, while choosing the P2 Alternative for other portions of the facility for which the pollution prevention practices are most suited. EPA believes that this change will also reduce burden.

In addition, EPA has made some changes to the listed pollution prevention practices. First, the two tables of listed practices, as found in Appendix B of the Supplemental Notice, have been combined into one table. In addition, based on comments, revisions have been made to the language used on the table of listed practices. Under the final rule, any practice may be modified with an adequate justification. When no justification is listed for the specific practice it can be modified via best professional or engineering judgement (BPJ or BEJ, respectively). EPA believes this is appropriate due to the unique and individual situations that may arise at a particular facility (see the Comment Response Document in the rulemaking record or the P2 Guidance Manual for the PFPR Industry for examples of such situations). However, for listed practices where no justification is listed on the table, a facility will initially have to submit a request for a modification to the permitting/control authority for review and approval. The permitting/control authority is expected to use BPJ or BEJ to decide if the justification provided is adequate. In addition, the permitting/control authority will be able to add or replace practices specified by the rule with new or innovative practices that are more effective at reducing the pollutant loadings from a specific facility to the environment.

EPA has also added some additional justifications to the table of listed practices based on comments. For example, EPA will allow facilities to modify the practice of reusing and/or storing and reusing rinsates generated by rinsing of drums containing only inerts when a facility can demonstrate that the large concentration of the inert in the formulation creates more volume, after using water conservation practices, than could feasibly be reused or when the concentration of the inert is so small (i.e., perfumes) that the reuse would cause a formulation to exceed the ranges allowed in the Confidential Statement of Formula (CSF).

Based on comment, EPA has also combined, added and removed other practices. For example, EPA has added a practice concerning dry formulation interior equipment cleaning that specifies that facilities must cleanout such interiors with dry carrier prior to any water rinse and that this carrier material should preferably be stored and reused in future formulation of the same or compatible product (or, as a last resort, properly disposed of as solid waste). EPA has combined many of the water conservation practices, such as use of flow reduction on hoses, use of low volume/high pressure rinsing equipment and floor scrubbing machines, into one listed practice. Finally, EPA has removed the provision for dedicated equipment that was contingent on the inability to reuse interior rinsates. Instead, this practice will be discussed in the P2 Guidance Manual for the PFPR Industry. (See Table 8 to Part 455 of the final regulation, for the listed practices and listed justifications).

Furthermore, EPA has refined the definition of P2 allowable discharge. In response to comment, this definition states that ''appropriate pollution control technologies'' include not only those technologies listed on Table 10 of the regulation, but also include a pesticide manufacturer's treatment system or an equivalent system, used individually or in any combination to achieve the level of pollutant reduction determined by the permitting authority or control authority. An equivalent system is a wastewater treatment system that is demonstrated in literature, treatability tests or self-monitoring data to remove a similar level of pesticide active ingredient (PAI) or priority pollutants as the applicable treatment technology listed in Table 10 to part 455 of the final regulation.

Finally, EPA has decided to allow the control authority to use best engineering judgement to waive pretreatment at the PFPR facility prior to discharge to the POTW under certain circumstances. Under the final P2 Alternative to zero discharge, an indirect discharger must pretreat the portion of their allowable P2 discharge that includes interior equipment rinsates (including drum rinsates), leak and spill cleanup water and floor wash prior to discharge to the POTW. However, EPA will allow the control authority to waive the pretreatment requirements for floor wash and the final interior rinse of a triple rinse that has been demonstrated to be non-reusable when the facility demonstrates that the level of PAIs and priority pollutants in such wastewaters are at a level that is too low to be effectively pretreated at the facility and have been shown to neither pass through or interfere with the operations of the POTW. The control authority should also take into account whether or not the facility has employed water conservation when generating such a non-reusable wastewater.

C. Applicability to On-Site and Stand-alone Research & Development (R&D) Laboratories

EPA has clarified the applicability of the final PFPR regulations to on-site and stand-alone R&D laboratories (i.e., no PFPR on-site). The final PFPR effluent guidelines and standards do not apply to wastewater generated from the development of new formulations of pesticide products and the associated efficacy and field testing (where resulting product is not manufactured for sale). This includes such wastewaters generated at stand-alone R&D laboratories as well as at R&D laboratories located on-site at PFPR facilities. EPA received many comments describing the operations at both on-site and stand-alone R&D facilities. Commenters believe that wastewaters generated at these R&D laboratories have extremely limited reuse potential due to their experimental nature, as such formulations may only be produced once or, at most, for one set of trials. Therefore, commenters believe that the pollution prevention practices listed in the Supplemental Notice (for example, reuse of interior rinsates in future formulation) are not amenable to these one-time wastewaters. In addition, experiments require the use of experimental controls. According to commenters, the addition of rinsates into the ''experimental design could alter the results of the experiment and render the data obtained useless.'' EPA has taken the above information into account, in addition to the typically low quantities discharged from these operations and believes that the wastewaters generated by experimental formulation, efficacy and field testing can be adequately addressed in permits

and pretreatment agreements through BPJ and BEJ, respectively.

D. Clarification of Issues Concerning PFPR/Manufacturers

Pesticide Manufacturing is covered by 40 CFR part 455 subparts A and B. However, close to 50 pesticide manufacturers also perform pesticide formulating, packaging and repackaging at their facility (called ''PFPR/Manufacturers''). EPA has included a discussion, below, to aid in clarifying how the final rule applies to the PFPR/Manufacturers in regard to three specific issues. First, EPA will clarify the difference between adding a solvent to stabilize an active ingredient and adding a solvent (or other inert ingredients) to formulate a pesticide product, and which practice constitutes manufacturing and which constitutes formulation. Second, EPA will discuss whether on-site incineration can be considered as achieving zero discharge under the PFPR final rule. Finally, EPA will amend and clarify the interpretation of the 1978 zero discharge BPT rule for direct discharging PFPR/Manufacturers and PFPR stand-alone facilities.

1. Stabilizing versus Formulating

Pesticide manufacturers may sometimes add a solvent (organic or aqueous) to a manufactured PAI or intermediate for the purpose of stabilizing the product (e.g., for transport or storage). The Pesticide Manufacturing Final Technical Development Document [EPA–821–R–93–016; page 1–9] states that dilution of the manufactured active ingredient is only covered by the Pesticide Manufacturing rule when it is ''a necessary step following a chemical reaction to stabilize the product.'' Thus, EPA would like to clarify that manufacturers can perform such operations without being subject to the PFPR effluent guidelines as long as it is a necessary step to stabilize the product following a chemical reaction. Typically, such operations are performed without placing the pesticide in a marketable container (i.e., they are shipped in bulk via tank truck, rail car or tote tank). However, PFPR facilities should not conclude that they can receive PAIs (that they do not manufacture), even in bulk quantities, and dilute it with solvent or other carrier without being subject to the PFPR effluent guidelines, as this would be considered formulating under § 455.10.

2. On-site Incineration as Zero Discharge

Although EPA proposed zero discharge limitations based on pollution prevention, recycle/reuse and treatment for reuse, facilities may meet this zero discharge requirement through a number of other practices. These practices include hauling wastewater to off-site destinations, such as sites which have incineration, deep well injection disposal and centralized (commercial) wastewater treatment and subsequent discharge. In some cases, wastewaters are returned to the registrant or manufacturer. In a few instances, on-site incineration of PFPR wastewaters is being conducted.

EPA received comment requesting clarification of whether on-site incineration is an acceptable means of achieving zero discharge. For purposes of this rule, EPA considers on-site incineration a valid option for achieving zero discharge of PFPR process wastewaters. Wet scrubbing devices used for air pollution control on existing on-site incinerators at PFPR facilities are not subject to the PFPR effluent guidelines. The only existing on-site incinerators at facilities covered by the PFPR regulation are at facilities which also manufacture pesticide active ingredients (PFPR/Manufacturers). Scrubber wastewater discharges from these incineration activities are currently regulated under the pesticide manufacturing effluent guidelines (40 CFR part 455, subparts A and B; see 58 FR 50638, September 28, 1993) for the PAIs manufactured at these facilities.

On-site incineration at new sources (i.e., NSPS and PSNS), would also qualify as meeting zero discharge under the PFPR regulation and scrubber water discharges from these on-site incinerators would be covered by the pesticide manufacturing new source standards. However, scrubber wastewater discharges from the on-site incineration of PAIs not regulated by the pesticide manufacturing rule would have to be controlled using a BPJ or BEJ basis.

3. Amending and Clarifying of BPT

The 1978 BPT regulation (43 FR 44846; September 29, 1978) established a zero discharge limitation for direct discharges from pesticide formulating and packaging[5] facilities. This included pesticide formulating, packaging and repackaging that occurred at direct discharge pesticide manufacturing facilities as well as stand-alone PFPR facilities.[6] The basis for the 1978 zero discharge BPT limitation was water conservation, reuse and recycle practices, with any residual water being evaporated or hauled off-site to a landfill. However, many facilities that were direct dischargers in 1978 switched to indirect discharge of wastewaters through POTWs instead of achieving zero discharge via recycle and land filling or evaporation. Due to the 1978 BPT regulation, presently, there should be no direct discharging PFPR facilities. However, the zero discharge limitation was not interpreted or implemented in the same way for PFPR/Manufacturers as it was for stand-alone PFPR facilities.

It is EPA's understanding that permitting authorities incorporated the BPT zero discharge standard for PFPR wastewaters into the pesticide manufacturers' NPDES permits as a ''zero allowance.'' A zero allowance would let a PFPR/Manufacturer discharge PFPR wastewaters along with their pesticide manufacturing wastewaters as long as they did not exceed the pesticide limitations in the Pesticide Manufacturing rule. The 1978 pesticide manufacturing BPT limitations were presented as a total pesticides limit for 49 specific PAIs. However, the more recent BAT and NSPS limitations (58 FR 50638; September 28, 1993) do not set a total pesticides limit but, instead set individual production-based limitations. Since the pesticide manufacturing limits are based solely on the manufacturing production and do not include the PFPR production, permits could still use a zero allowance approach to allow discharges of PFPR wastewater from these combined facilities.

At the time of proposal, EPA did not believe it was necessary to amend the 1978 BPT because the zero discharge limitation was comparable to the proposed standard of zero discharge.[7] EPA recognized that the bases for the 1978 BPT and proposed rule were not identical and that land filling and evaporation were no longer the best options for achieving zero discharge (59 FR 17870). However, EPA believed that

[5] In 1978 repackaging was not included in the title of Subcategory C, but was covered by the BPT regulation and, therefore, will be included in the title for the final rule.

[6] A stand-alone PFPR facility is a PFPR facility where either: (1) No pesticide manufacturing occurs; or (2) where pesticide manufacturing process wastewaters are not commingled with PFPR process wastewaters. Such facilities may formulate, package or repackage or manufacture other non-pesticide chemical products and be considered a ''stand-alone'' PFPR facility.

[7] EPA proposed a zero discharge standard for PSES based on pollution prevention, recycle/reuse and, when necessary, treatment and reuse and expected it to be implemented via ''no flow'' of process wastewater.

since both the 1978 BPT and the proposed rule were largely based on water conservation, recycle and reuse practices, facilities could meet BPT in a manner similar to the proposed rule.

Following proposal, EPA received many comments on and requests for revision of the BPT regulation from the PFPR/Manufacturing facilities and trade associations. Commenters raised issues related to the technical feasibility of zero discharge for both the proposed rule and the 1978 BPT rule.

Commenters believed that, because not all wastewaters were reusable as EPA had assumed, the potential increase in cross-media impacts associated with a zero discharge regulation in addition to the large costs associated with contract hauling for incineration made any zero discharge regulation infeasible. The commenters requested numeric discharge limitations and/or a ''de minimis'' discharge allowance (associated with pollution prevention practices) for their PFPR wastewaters and that BPT be revised accordingly. Based on these and other comments on the proposed rule, EPA developed the Zero/P2 Alternative for PSES and BAT (for Subcategory C facilities) which was discussed in the Supplemental Notice and revised based on additional comment for today's final rule.

Commenters also specifically commented on the need for revision of the 1978 BPT due to: (1) Certain practices on which the 1978 BPT was based (for example, land filling and evaporation) are no longer desirable because they may cause cross-media impacts or may no longer be available; and (2) the changes in PAIs and pesticide formulation chemistries since 1978. For example, many pesticide products have been reformulated from an organic solvent-based product to a water-based product to avoid the generation of volatile organic compounds (VOCs). This has, in many cases, caused an increase in the volume of wastewater generated by this industry. In addition, many facilities are switching to safer, more ''environmentally friendly'' pesticide active ingredients which would change the characteristics of the wastewaters from those determined in 1978. Commenters believe that EPA must revise BPT or account for the additional costs associated with the current practices that would be utilized to meet the zero discharge limitation (i.e., off-site incineration).

Based on the comments discussed above, EPA has decided to amend BPT for both the existing direct discharging PFPR/Manufacturers and stand-alone PFPR facilities to allow them to choose between zero discharge and the P2 Alternative. EPA believes that although the stand-alone PFPR facilities are already achieving zero discharge, in compliance with the 1978 BPT, the methods they are employing may potentially result in cross-media impacts that the use of the P2 Alternative would potentially reduce.

Also, these changes will make BPT consistent with BAT (and PSES) while essentially achieving the same pollutant removals and potentially decreasing cross-media impacts associated with various off-site disposal methods. In addition, the change to the BPT limitation that is being promulgated today for PFPR/Manufacturers will clarify that the method by which the zero discharge limitation has been implemented (i.e., use of a zero allowance) is appropriate.

The final PFPR rule will allow discharge of PFPR wastewaters from PFPR/Manufacturing facilities in two specific ways. For those facilities choosing to comply with zero discharge (as opposed to the P2 Alternative), their permits should incorporate the ''zero allowance'' approach for the PFPR portion of their operations for the PAIs that they manufacture. For those PAIs formulated and not manufactured at the facility, the permit should apply a strict zero discharge. In part, this is because their pesticide manufacturing wastewater treatment system may not consist of the appropriate treatment technologies for such PAIs or the treatment system may not be designed to treat the additional volumes and/or concentrations of the ''non-manufactured'' PAIs.

However, PFPR/Manufacturers can choose the P2 Alternative to zero discharge. Such facilities would not have to achieve zero discharge or zero allowance of their PFPR wastewaters. Instead, these facilities would comply with the practices specified in the P2 Alternative and would receive a ''P2 discharge allowance'' following treatment (see § 455.41 of the final regulation for the definition of P2 allowable discharge). The P2 discharge allowance can be applied to both pesticides that are formulated/packaged/repackaged and manufactured as well as those that are not manufactured on-site. [Note: Facilities can choose between zero discharge and the P2 Alternative on a product family/process line/process unit basis.]

The treatment system used to treat the combined PFPR and pesticide manufacturing wastewaters must incorporate treatment that is appropriate for those PAIs which are not also manufactured on-site (i.e., those PAIs for which individual pesticide manufacturing production-based limitations are not contained in the NPDES permit). Treatment is deemed appropriate through the use of: treatability studies found in literature or performed by the facility; long-term monitoring data; or Table 10 of the final rule.

As discussed above, EPA is also amending BPT for stand-alone PFPR facilities. Stand-alone facilities that do not send their wastewaters to POTWs can choose to comply with the P2 Alternative or can remain as zero discharge. Facilities choosing the P2 Alternative may have to apply for an NPDES permit if they do not already have a permit.

E. Clarification of Refilling Establishments

EPA has decided to use the same general definition for ''refilling establishment'' as in the proposed effluent guideline and the proposed FIFRA Standards for Pesticide Containers and Containment rule (i.e., an establishment where the activity of repackaging pesticide product into refillable containers occurs). However, EPA will use different applicability statements in each of the regulations to further define the term as appropriate for the particular regulation. (See the Comment Response Document for additional discussion). The limitations and standards of Subpart E of the PFPR final rule apply to the repackaging of pesticide products performed by refilling establishments: (a) That repackage agricultural pesticides; (b) whose primary business is wholesale or retail sales; and (c) where no pesticide manufacturing, formulating or packaging occurs. Subpart E (Refilling Establishments) is not applicable to wastewater generated from custom application or custom blending.

F. RCRA Issues

A number of commenters requested clarification concerning the potential for conflict between the proposed zero discharge effluent guidelines limitations and standards and certain requirements under the Resource Conservation and Recovery Act (RCRA). Specifically, commenters requested that EPA explain, in the final rule, its interpretation of the wastewater treatment unit exemption under RCRA (40 CFR 264.1(g)(6), 265.1(c)(10)) with respect to facilities regulated by a national effluent guideline requirement of zero discharge and how such an exemption would apply to the Universal Treatment System (UTS). They also requested

clarification on the 90-day RCRA hazardous waste storage limitation.

In general, owners and operators of hazardous waste treatment, storage, and disposal (TSD) facilities must meet the standards outlined in 40 CFR part 264 (and part 265 for interim status). However, the wastewater treatment unit exemption (40 CFR 264.1(g)(6), 40 CFR 265.1(c)(10)) is intended to exempt, from certain RCRA requirements, wastewater treatment units at facilities that are subject to the NPDES or pretreatment requirements under the Clean Water Act[8] (for example, PFPR facilities). The specific definition of wastewater treatment units that are exempt from certain RCRA requirements is found in 40 CFR 260.10. The RCRA wastewater treatment unit exemption does not exempt hazardous wastewaters at these facilities from RCRA requirements, but does exempt the facilities from obtaining a TSD permit for wastewater treatment systems treating, storing, or generating listed (40 CFR 261.30–33) or characteristic (40 CFR 261.20–24) hazardous wastes. EPA points out that many pesticide active ingredients are not RCRA listed hazardous wastes and most PFPR wastewaters do not exhibit hazardous waste characteristics; therefore, such non-hazardous wastewaters would not be covered by the RCRA Subtitle C requirements.

As mentioned above, many commenters requested that EPA clarify whether or not the wastewater treatment unit exemption can be applied to facilities that are not discharging their treated wastewater effluent due to a zero discharge limitation in a national effluent guideline. Facilities subject to an effluent guideline which sets a zero discharge or other limitations or standards (such as the P2 Alternative) can, in fact, be eligible for the RCRA wastewater treatment unit exemption, assuming that they also satisfy the exemption's other criteria.

Commenters also requested clarification on how the RCRA 90-day limit on the storage of hazardous wastes (40 CFR 262.34) applies to rinsates being stored for subsequent reuse in accordance with the PFPR effluent guidelines. Generally, RCRA TSD permits (or interim status) are required for facilities that store hazardous waste on site. However, the RCRA regulations allow facilities that generate hazardous waste to store the waste without a permit or interim status provided that certain criteria, including a 90-day limit on storage for large quantity generators, are satisfied (these criteria are outlined in 40 CFR 262.34). As mentioned earlier in this section, most PFPR wastewaters would not be defined as RCRA hazardous waste, either because the wastewater does not meet a RCRA listing, or does not exhibit any hazardous characteristic; of course, generators are still required to make this determination with respect to their own wastes (40 CFR 262.11). If a material is not a hazardous waste, the RCRA regulations, including storage requirements, do not apply.

For any rinsewaters that potentially meet a RCRA listing or exhibit a RCRA characteristic, such rinsewaters being stored for direct reuse as outlined under today's final PFPR effluent guidelines and standards would not be considered wastes by the Agency (see 40 CFR 261.2(e)(1)). As described elsewhere in today's rulemaking, these rinsewaters do not require treatment prior to reuse and, due to stringent product specifications, do not contain constituents that are not needed in the product being formulated. In these situations where the rinsewaters are not classified as a waste, the RCRA regulations (including the generator requirements and storage requirements) do not apply. However, the RCRA regulations do require that materials being stored for reuse not be accumulated speculatively (speculatively accumulated materials are classified as wastes). A material is not accumulated speculatively if the person accumulating it shows that the material is recyclable, has a feasible means of being recycled, and that during the calendar year, the amount of material recycled equals at least 75 percent by weight or volume of the amount of that material accumulated at the beginning of the period. See 40 CFR 261.1(c)(8) and 261.2(e)(2)(iii).

IV. The Final Regulation

A. Pretreatment Standards for Existing Sources (PSES)

1. Pesticide Formulating, Packaging and Repackaging (Subcategory C)

Under the final rule, EPA is establishing a zero discharge pretreatment standard with a P2 Alternative which allows a discharge to POTWs. The zero discharge standard is based on pollution prevention, recycle and reuse practices and, when necessary, treatment (through the Universal Treatment System) for reuse. The basis also includes some amount of contract hauling for off-site incineration which may be necessary to achieve zero discharge. Compliance with the alternative (P2 Alternative) is based on performing specific pollution prevention, recycle, reuse and water conservation practices (as listed in Table 8 to part 455 of the final rule) followed by a P2 allowable discharge which requires treatment of interior wastewater sources (including drum rinsates), leak/spill cleanup water and floor wash prior to discharge to a POTW.[9]

EPA visualized the Universal Treatment System (UTS) as a flexible system consisting of a variety of treatment technologies that have been determined to be effective for treating PFPR wastewaters. The UTS can include various combinations of treatment technologies consisting of emulsion breaking, hydrolysis, chemical oxidation, metals precipitation and carbon adsorption. See Section 7 of the Final Technical Development Document [EPA–821–R–96–019] for the PFPR effluent guideline and the proposal (59 FR 17873) for a detail description of the UTS.

EPA determines which pollutants to regulate in PSES on the basis of whether or not they pass through, interfere with, or are incompatible with the operation of POTWs (including interference with sludge practices). A pollutant is deemed to pass through when the average percentage removed nationwide by well-operated POTWs (those meeting secondary treatment requirements) is less than the percentage removed by directly discharging facilities applying BAT for that pollutant. In the pesticide chemical manufacturing final rule, phenol, 2-chlorophenol, 2,4-dichlorophenol and 2,4-dimethylphenol were found to not pass through POTWs (58 FR 50649; September 28 1993). Phenol is a PAI that is exempted from this final rule under the sanitizer exemption while the remaining three chemicals are priority pollutants.

As discussed in Section III.A.1, based on comments and the addition of the pollution prevention alternative to the zero discharge standard for the final rule, EPA believes it is appropriate to exempt phenol from the final PFPR effluent guidelines and standards, and to exclude 2-chlorophenol, 2,4-dichlorophenol and 2,4-dimethylphenol from regulation in the final categorical pretreatment standards (PSES and

[8] Section 402 of the Clean Water Act addresses the NPDES requirements, while Section 307(b) addresses the pretreatment standards.

[9] In individual cases the requirement of wastewater pretreatment prior to discharge to the POTW may be removed for floor wash or the final rinse of a non-reusable triple rinse by the control authority when the facility has demonstrated that the levels of PAIs and priority pollutants in such wastewaters are at a level that is too low to be effectively pretreated at the facility and have been shown to neither pass through or interfere with the operations of the POTW.

PSNS) because these three pollutants have been determined not to pass through POTWs.

EPA has estimated the compliance cost for the industry to achieve the pretreatment standards (PSES) contained in the final rule at $29.9 million annually ($1995). The current PAI pollutant loading to POTWs is estimated at 192,789 pounds with PAI removals achieved by the final regulation estimated at 189,908 pounds (assuming zero removals by POTWs currently—see Cost-Effectiveness Analysis in Section V.D.6). This means that compliance with the final rule would remove almost 99% of the current pollutant loading. Due to the toxic nature of the majority of PAIs, the equivalent toxic weighted pollutant removals are 7.6 million pound equivalents [10].

2. Refilling Establishments (Subcategory E)

EPA is establishing pretreatment standards for existing refilling establishments at zero discharge of pollutants in process wastewaters to POTWs. This standard is based on collection and storage of process wastewaters followed by reuse of the wastewaters as make-up water for application to fields in accordance with the product label. Based on the PFPR 1988 questionnaire survey, 98 percent of the existing refilling establishments achieve zero discharge.

Only a small number of refilling establishments are indirect dischargers and EPA has estimated that they can comply with the final pretreatment standards at nearly zero cost. EPA has estimated that only 19 facilities (of the 1134) do not achieve zero discharge and they currently discharge to POTWs. EPA estimates a capital cost of only $500 (i.e., the approximate cost of a minibulk tank to store water for reuse) for each the 19 facilities to meet the zero discharge PSES standard.

[10] The toxic weighted pollutant removals (in pound-equivalents) for the final rule are not directly comparable to the toxic weighted pollutant removals presented in the proposal or supplemental notice. This is because: (1) The method used to convert acute toxicity values to chronic value was revised from a 1:100 ratio to a 1:10 ratio and reduces the toxic weighting factor for many PAIs; (2) the toxic weighting factor for the pyrethrins was revised; and (3) EPA is using an average non-272 PAI toxic weighting factor based on values for 91 non-272 PAIs instead of using the current loading-weighted average of the toxic weighting factors for the 272 PAIs.

B. Best Practicable Control Technology Currently Available (BPT)

1. Pesticide Formulating, Packaging and Repackaging (Subcategory C)

As discussed in Section III.D.3. of today's notice, EPA has amended and clarified the BPT limitations for the PFPR/Manufacturers and established BPT limitations for the stand-alone PFPR facilities (ie., PFPR facilities where no pesticide manufacturing occurs or where pesticide manufacturing process wastewaters are not commingled with PFPR process wastewaters). In addition to clarifying the use of ''zero allowance'' for zero discharge for PFPR/Manufacturers, EPA is providing both the PFPR/Manufacturers and the stand-alone PFPRs with the opportunity to use the P2 Alternative.

Under the final rule, EPA is amending the 1978 BPT standard by establishing a zero discharge limitation with a compliance alternative which provides for P2 allowable discharge to surface waters. EPA is also establishing a zero discharge limitation (without the use of a ''zero allowance'' permitting mechanism) with a compliance alternative for a P2 allowable discharge for the stand-alone PFPR facilities. (See Section III.D.3. for additional discussion.)

The zero discharge limitation is based on pollution prevention, recycle and reuse practices and, when necessary, treatment and reuse for those PAIs that are formulated, packaged and/or repackaged but are not also manufactured at the facility. The basis also includes some amount of contract hauling for off-site incineration.

Zero allowance is established for PFPR/Manufacturers for those pesticides that are formulated, packaged and/or repackaged *and* manufactured at the facility. Zero allowance is based on pollution prevention, recycle and reuse practices and treatment and discharge through the manufacturer's wastewater treatment system within the pesticide manufacturing production-based numeric limitations (i.e., giving no allowance for the PFPR wastewater or its production). This is consistent with how the existing 1978 BPT zero discharge requirements have been implemented by permit writers.

The compliance alternative (P2 Alternative) is based on performing specific pollution prevention, recycle, reuse and water conservation practices (as listed in Table 8 to part 455 of the final rule) followed by a P2 allowable discharge which requires treatment of all process wastewaters prior to direct discharge to surface waters.

EPA has estimated that there are no additional costs or pollutant removals associated with the BPT limitation for the PFPR/Manufacturers, as these costs have already been absorbed by the industry over the past 18 years as a result of the 1978 BPT regulation. (See Section IV.C.1. for a discussion on BAT and the associated costs of compliance).

EPA has not assigned any additional costs to the stand-alone PFPR facilities as they are also currently achieving zero discharge. However, facilities may choose to take advantage of the P2 Alternative in order to achieve a decrease in cross-media impacts. Depending on the current means of achieving zero discharge, a facility's costs may increase or decrease when switching to the P2 Alternative. The costs may increase initially due to the cost of installing a wastewater treatment system due to the associated capitol costs; however, EPA believes that over the long term, the annual costs for those facilities which select the P2 Alternative would be lower. EPA assumes that facilities will make the choice, to continue to comply with zero discharge or to move to the P2 Alternative based, in significant part, on economic considerations. Therefore, EPA believes that if the costs associated with the P2 Alternative were significantly higher, the facility would not alter their current means of compliance. Accordingly, EPA has assumed no incremental costs as a result of the addition of the P2 Alternative to BPT for stand-alone PFPR facilities.

2. Refilling Establishments (Subcategory E)

The existing BPT regulations did not cover refilling establishments. As discussed in the proposal (59 FR 17870), the practice of refilling minibulks did not begin until the late 1980's, i.e., after the original BPT regulation was promulgated in 1978. Based on the PFPR survey, 98 percent of the existing refilling establishments achieve zero discharge. EPA proposed zero discharge of process wastewater pollutants as the BPT limitations for refilling establishments.

In the final regulation EPA is establishing a BPT limitation for existing refilling establishments at zero discharge of pollutants in process wastewaters to waters of the U.S. This limitation is based on collection and storage of process wastewaters, including rinsates from cleaning minibulk containers and their ancillary equipment; and wastewaters from secondary containment and loading pads. The collected process wastewater would be reused as make-up water for

application to fields in accordance with the product label. Since greater the 98% of these facilities already achieve zero discharge and the remaining facilities discharge to POTWs, the costs associated for BPT have been estimated to be nearly zero.

C. Best Available Technology Economically Achievable (BAT)

1. Pesticide Formulating, Packaging and Repackaging (Subcategory C)

EPA has established BAT limitations that are equivalent to the limitations established for BPT for PFPR/Manufacturers and stand-alone PFPR facilities (see Section IV.B.1 for discussion of BPT limitations).

Under the proposal, existing direct discharge PFPR/Manufacturers were expected to treat (for reuse) their PFPR wastewaters in a separate treatment system from their pesticide manufacturing wastewater treatment systems. EPA estimated the compliance costs for these facilities by costing them for separate PFPR universal treatment systems.

Under the final rule, existing direct discharging Subcategory C facilities will have a choice of either complying with a zero discharge limitation or the P2 Alternative (see Section III.D.3. for a discussion on amending and clarifying BPT). However, the rule clarifies that in meeting the zero discharge limitation, permitting authorities may authorize the commingling of pesticide manufacturing and PFPR process wastewaters to meet the pertinent BAT limitations for pesticide manufacturers with a zero allowance for PAIs in PFPR wastewaters. EPA has revised the cost model to account for changes in the final rule due to updated analytical data, changes in scope and the addition of the P2 Alternative. However, EPA believes that an overestimate of the costs would result if EPA included costs for separate UTS systems when the facilities' current controls, used for treating PFPR wastewaters (i.e., prior to commingling with pesticide manufacturing wastewater) and/or treating commingled wastewater (i.e., their pesticide manufacturing treatment systems), already achieve the BAT limitation of zero discharge or ''zero allowance.''

Thus, EPA is not including these costs and removals in the total industry estimate. However, EPA has made a determination of economic achievability even if these costs would be incurred, and is presenting the costs and pollutant removals associated with the (17) direct discharging PFPR/Manufacturers for informational purposes. When current treatment in place is not accounted for, the estimated compliance cost for the PFPR/Manufacturers to comply with BAT is $2.8 million ($1995) and is estimated to remove greater than 99% of the pollutants. This equals 50,248 lbs (or 71.6 million lb-eq.[11]) of PAIs. Again, EPA believes this cost is economically achievable.

2. Refilling Establishments (Subcategory E)

EPA is establishing BAT limitations for this subcategory that are equivalent to the limitations established for BPT. Since BPT requires zero discharge of process wastewater pollutants and 98 percent of the existing refilling establishments already achieve zero discharge, EPA believes the same technology basis and discharge prohibition is appropriate and economically achievable for BAT.

D. New Source Performance Standards (NSPS)

1. Pesticide Formulating, Packaging and Repackaging (Subcategory C)

EPA has set the new source performance standards for PFPR/Manufacturers and stand-alone PFPRs the same as BPT and BAT. The new source standards are established as follows:

EPA has established NSPS limitations equivalent to the limitations that are established for BPT and BAT. Since EPA found the Zero/P2 alternative to be economically achievable for existing facilities under BPT and BAT on a facility basis and since new facilities will be able to choose between zero discharge and the P2 Alternative on a product family/process line/process unit basis, EPA believes that this NSPS standard does not create a barrier to entry.

2. Refilling Establishments (Subcategory E)

EPA is establishing NSPS standards for this subcategory that are equivalent to the limitation established for BPT and BAT. Since BPT requires zero discharge of process wastewater pollutants and 98 percent of the existing refilling establishments already achieve zero discharge, EPA believes an equivalent technology basis is appropriate for NSPS and will not create a barrier to entry.

[11] The large number of toxic weighted pound equivalents is driven by a large PFPR production value reported from a single PFPR/Manufacturer using coumaphos with a toxic weighting factor = 5.6×10^3.

E. Pretreatment Standards for New Sources (PSNS)

1. Pesticide Formulating, Packaging and Repackaging (Subcategory C)

EPA is establishing PSNS standards for this subcategory that are equivalent to the standards established for PSES (i.e., zero discharge with a compliance alternative for a P2 allowable discharge). EPA believes that the standards established for PSNS will not create a barrier to entry as they are equivalent to PSES which were found to be economically achievable.

EPA did not propose to set PSNS (or NSPS) equal to PSES (or BAT). Although the PSNS Zero/P2 Alternative standard discussed above is a change from the proposed PSNS, it is consistent with the Supplemental Notice and comments submitted. At proposal, PSES included a partial exemption for exterior wastewater sources from small sanitizer facilities (see Section II.E of today's notice for a discussion of the proposed partial sanitizer exemption); however, the proposed PSNS did not include such an exemption and was found not to create a barrier to entry for new facilities. The partial sanitizer exemption no longer effects the economic achievability of the standards because in response to comments, sanitizer products are no longer included in the scope of the PFPR effluent guidelines. Based on the addition of the P2 Alternative option to these effluent guidelines and standards and the associated estimated reductions in cross-media impacts, EPA believes that it is appropriate to give new facilities the opportunity to use the P2 Alternative to meet PSNS.

2. Refilling Establishments (Subcategory E)

EPA is establishing PSNS standards for this subcategory that are equivalent to the limitations established for PSES (i.e., zero discharge). In addition, BPT, BAT and NSPS also require zero discharge of process wastewater pollutants, and 98 percent of the existing refilling establishments already achieve zero discharge; thus, EPA believes an equivalent technology basis is appropriate for PSNS and will not create a barrier to entry.

F. Best Conventional Pollutant Control Technology (BCT)

1. Pesticide Formulating, Packaging and Repackaging (Subcategory C)

EPA has established BCT limitations that are equivalent to the limitations established for BPT. This is because BPT and BAT establish zero discharge

with a compliance alternative for a P2 allowable discharge and BCT can be no less stringent than BPT and no more stringent that BAT. EPA believes there are no additional costs associated with these limitations.

2. Refilling Establishments (Subcategory E)

EPA is establishing BCT limitations for this subcategory that are equivalent to the limitations established for BPT. Since BPT requires zero discharge of process wastewater pollutants and 98 percent of the existing refilling establishments already achieve zero discharge, EPA believes an equivalent technology basis is appropriate for BCT.

V. Economic Considerations

A. Introduction

Promulgation of the final PFPR rule requires that the discharge limitations be both technically and economically achievable. This section of today's notice reviews EPA's analysis of the economic impacts of the regulation and presents EPA's finding that the limitations are economically achievable.

EPA's detailed economic impact assessment can be found in the report titled ''Economic Analysis of Final Effluent Limitations Guidelines and Standards for the Pesticide Formulating, Packaging, and Repackaging Industry'' (hereafter ''final EA'') [EPA–821–R–96–017]. The report estimates the economic effect on the industry of compliance with the regulation in terms of facility closures (severe impacts), and conversions of production lines to alternate activities and/or compliance costs exceeding five percent of facility revenues (moderate impacts). The report also includes: Analysis of the effects of the regulation on new pesticide formulating, packaging, and repackaging facilities and a Regulatory Flexibility Analysis detailing impacts on small businesses and small entities. A separate report, ''Cost-Effectiveness Analysis of Final Effluent Limitations Guidelines and Standards for the Pesticide Formulating, Packaging, and Repackaging Industry,'' presents an analysis of the cost-effectiveness of the final regulation. All of these analyses support the conclusion that the effluent limitations guidelines and standards contained in the final PFPR regulation are economically achievable by the PFPR industry.

The discussion of economic achievability is organized in three sections, as follows. Section V.B. summarizes the economic findings for the regulation as proposed in April 1994. Section V.C. reviews certain changes in the regulation since proposal that were the basis of a supplemental notice issued in June 1995; and Section V.D. presents the economic analysis of the final regulation, as delineated in the preceding sections of this preamble.

B. Review of the Proposed Regulation

The April 14, 1994 notice of proposed rulemaking (59 FR 17850) included a description of the anticipated economic impacts of proposed effluent limitations guidelines and standards for the PFPR industry. These economic impacts are briefly reviewed below. (See Section II.E. for a review of the proposed regulation.)

At proposal, BCT and BAT requirements were proposed to be equivalent to the 1978 BPT requirements; therefore, no additional costs were expected for compliance with the BCT and BAT limitations. Accordingly, the EIA focused on analyzing alternative PSES options for the two industry subcategories.

1. Subcategory C: PFPR and PFPR/ Manufacturers

Since completion of the proposal EIA, EPA has continued to review its information regarding the structure of the PFPR industry and has increased its estimates of the numbers of facilities using only non-272 PAIs that would potentially be subject to the Subcategory C regulation. As a result, EPA's estimates of the number of affected facilities and the impacts and costs of the proposed regulation are higher than those presented at proposal. For example, at proposal, EPA estimated that Subcategory C included 1,479 water-using facilities that were potentially subject to regulation. Using the newer population estimates, EPA now estimates that under the proposal a total of 2,018 water-using facilities would have been potentially subject to regulation. The increase in this estimate comes entirely from the increased estimate of the number of facilities using only non-272 PAIs.[12] The following discussion of the proposed Subcategory C regulation reflects these updated estimates of the numbers of facilities, costs, and impacts.

For the re-estimated proposed rule, EPA estimates that 2,018 Subcategory C, water-using facilities were potentially subject to regulation. Of these 2,018 facilities, 943 used the 272 PAIs that EPA originally considered for regulation[13] and 1,075 used only the additional non-272 PAIs. EPA estimates that 1,142 of these facilities would incur total annualized compliance costs of $71.9 million in 1995 dollars[14] under the proposed rule of zero discharge.

The EIA for the proposed regulation used three primary impact measures:

- Severe impacts, which were defined as facility closures;
- Moderate impacts or facility impacts short of closure, which were defined as line conversions or incurrence of annualized compliance costs exceeding five percent of facility revenue; and
- Employment losses, which, for the impact analysis, were assumed to accompany facility closures and line conversions (but not incurrence of annualized compliance costs exceeding 5 percent of facility revenue).

Under the proposed PSES requirements and using the updated estimate for the number of non-272 PAI-using facilities, EPA estimates that three facilities would close as a result of proposed regulation, while 327 facilities would incur moderate impacts. In addition, under the proposed zero discharge rule, EPA conservatively estimates total job losses at facilities incurring impacts at 890 full-time employment positions. EPA judges the proposed regulation as economically achievable using these updated impact values that are based on the higher number of non-272 PAI-using facilities.

In addition to the facility impact analysis, EPA analyzed the cost-effectiveness of the proposed regulation for Subcategory C facilities. Cost-effectiveness is calculated as the ratio of the incremental annual costs in 1981 dollars to the incremental pounds-equivalent of pollutants removed for each option. Using the updated estimates of costs and removals for the proposed regulation, EPA estimates total pollutant removals of 505,235 pounds, or 38.9 million pounds-equivalent on a toxic weighted basis, and an average cost-effectiveness value of $1.65 per pound-equivalent.[15] [16] EPA considers the proposed option to be cost-effective.

---

[12] Due to changes in scope for the final regulation, 1,411 water using facilities will be potentially subject to the final regulation.

[13] Many of these facilities also used non-272 PAIs in addition to the 272 PAIs.

[14] The costs of regulatory compliance are all reported in 1995 dollars. In the EIA and the Federal Register Notice for the regulation at proposal and in the Supplemental Notice, regulatory compliance were reported in 1988 dollars, the base year of the PFPR industry survey. All cost estimates, including the proposal and the supplemental notice have been brought forward to 1995.

[15] The toxicity of the non-272 PAIs used in generating this cost-effectiveness value was estimated as the average pre-compliance loading-weighted average toxicity of the 272 PAIs.

[16] At proposal, EPA reported an *average* cost-effectiveness, or the cost-effectiveness value calculated relative to the baseline of no regulation, and an *incremental* cost-effectiveness, or the cost-effectiveness relative to the next less stringent

For analysis of the final regulation, EPA revised the toxic weighting factors to reflect additional information on the toxicity of the PAIs. In general, the revisions reduced the estimated toxicity of the PAIs subject to regulation (see Section V.D.6, below, which contains the discussion of the cost-effectiveness analysis for the final regulation). Using these revised toxic weighting factors and also taking into account the updated estimates of costs and pollutant removals for non-272 PAI-using facilities, EPA estimates that the proposed regulation would remove an estimated 23.2 million pounds-equivalent, yielding a cost-effectiveness value of $2.77 per pound-equivalent ($1981).

2. Subcategory E: Refilling Establishments

At proposal, an estimated 1,134 refilling establishments (Subcategory E PFPR facilities) were potentially subject to regulation. EPA estimates that 98 percent of these facilities, were already in compliance with the proposed Subcategory E limitations and pretreatment standards. All but 19 of the 1,134 existing facilities were expected to incur no costs to comply with the proposed option. The remaining 19 facilities were expected to achieve compliance with no significant additional cost[17] (See Section VI.B.2). No economic impacts were estimated to occur due to compliance with the proposed rule.

C. Changes to the EIA Since Proposal: Issuance of the June 1995 Supplemental Notice

In response to public comments on the regulation, EPA issued a Supplemental Notice (60 FR 30217) on June 8, 1995 that solicited comment on proposed changes in the scope of the PFPR regulation for Subcategory C facilities and on the Zero/P2 Alternative. In addition, EPA revised the cost estimating methodology and economic impact estimates.

As discussed in Section III.B.4. of today's notice, EPA estimated compliance costs for each facility to comply with the Zero/P2 Alternative option. Each facility was assumed to choose either zero discharge or the P2 Alternative for compliance, depending on which alternative would impose the lower annualized costs on the facility. For the Supplemental Notice, EPA estimated total annualized compliance costs for facilities covered under PSES at $43.4 million, in 1995 dollars, or 40 percent less than the costs for the proposed regulation. Under the Zero/P2 Alternative option, no facilities were assessed as closures as the result of the compliance requirements, while 208 facilities were assessed as incurring moderate impacts.[18] The comparable values for the regulation for the proposal (re-estimated using the revised cost previously discussed) are 3 facility closures and 327 facilities with moderate impacts.

D. Assessment of Costs and Impacts for the Final PFPR Regulations

This section describes the impact measures used in the Economic Analysis, the estimated impacts associated with the final rule, impacts on new sources, and the cost-effectiveness analysis. As discussed below, EPA is promulgating the regulation for Subcategory E facilities as presented at proposal with storm water now exempted, but the analysis of costs and impacts for the Subcategory E regulation remain the same as presented at proposal. Accordingly, the following discussion focuses on the Pretreatment Standards for Existing Sources (PSES) regulation for Subcategory C facilities.

1. Summary of Economic Analysis Methodology and Data

The data sources and methodology for analyzing economic impacts remain the same as used at proposal and for the Supplemental Notice. For a more detailed discussion of the methodology used in the economic impact analysis, see the preamble for the PFPR regulation at proposal (59 FR 17850), the proposal EIA report and final EA report.

The economic impact analysis measures three types of primary impacts: severe impacts (facility closures), moderate impacts (facility impacts short of closure), and job losses. Each impact analysis measure is reviewed briefly below.

- *Severe Impacts.* Severe impacts, defined as facility closures, were assessed on the finding that the regulation would be expected to cause a facility to incur, on average, negative after-tax cash flow over the three-year period of analysis. This analysis was performed for PFPR/Manufacturers and for facilities that do not manufacture PAIs, but receive at least 25 percent of their revenue from PFPR activities. Facilities with relatively low reliance on PFPR activities as a source of revenue (i.e., less than 25 percent of revenue) were excluded from this analysis because EPA does not anticipate that such facilities would close in entirety because of costs of regulatory compliance associated with PFPR activities. EPA also did not include PFPR facilities from Subcategory E (refilling establishments) in this analysis largely because of their relatively low reliance on PFPR activities as a source of revenue (an average of 15 percent).
- *Moderate Impacts.* Moderate impacts were defined as a financial impact short of entire facility closure and were analyzed in two ways. First, PFPR facilities subject to the Subcategory C regulation and with less than 25 percent of revenue from PFPR activities were assessed for line conversions by comparing the after-tax return on assets (ROA) from PFPR activities after regulation with the ROA estimated to be achievable in an alternative line of business. Facilities for which the post-compliance ROA for PFPR activities was found to be less than the return achievable in an alternative line of business were assumed to switch out of PFPR operations. Second, all Subcategory C and E facilities, regardless of PFPR revenue reliance, were assessed for the incurrence of total annualized compliance costs exceeding five percent of facility revenue.
- *Employment losses.* Possible employment losses were assessed for facilities estimated to close as a result of regulation and for facilities estimated to convert PFPR lines to an alternative business activity. EPA believes that the estimates of employment loss resulting from this analysis are highly conservative because of the assumption that line conversions would result in loss of employment for a facility's PFPR-related employment. More realistically, EPA expects that line conversions will not generally lead to full loss of PFPR-related employment.

As in the economic impact analysis for the proposed PFPR regulation, these analyses for the final regulation assume that PFPR facilities would not be able to pass the costs of compliance on to their customers through price increases. Analysis of pesticide product markets and the likely response of pesticide product customers to price increases (as discussed in the proposal EIA), indicates that a substantial number of facilities should recover some part of their compliance costs through price

regulatory option considered. However, the incremental calculation and the comparison are no longer relevant as the alternative options at proposal are no longer under consideration. For this reason, in the current discussion, EPA is reporting only the cost-effectiveness value calculated relative to the baseline of no regulation.

[17] A capital investment of approximately $500 was estimated for each of these facilities.

[18] The cost and impact values for the Supplemental Notice regulation reflect updating of the estimates of non-272 PAI-using facilities.

increases. Thus, the analyses of compliance cost and impacts overstate the severity of the regulation's financial burden on the PFPR industry.

EPA extrapolated information on compliance costs, pollutant loadings, and the frequency of facility-level compliance impacts from data on facilities in the original PFPR industry survey to analyze the technical and economic impacts of regulating the additional non-272 PAIs.[19] In the following discussion, EPA has not separated the estimated costs or impacts according to which set of PAIs facilities are estimated to use. Additional details of the analysis of costs and impacts for the facilities using the different sets of PAIs may be found in the final EA.

Although the impact analysis methodology for the final regulation is unchanged from proposal (see the Proposal EIA), its application has been changed for analyzing the Zero/P2 Alternative. This regulatory option was analyzed for each sample facility as part of two separate compliance approaches: (1) Zero discharge and (2) pollution prevention in combination with treatment followed by discharge (see Section IV.A.1). Facilities were assumed to adopt the compliance approach with the lower total annualized compliance cost including both annual operating and maintenance costs and an annual allowance for capital outlays. Although most facilities were estimated to achieve compliance by pollution prevention and treatment, some were estimated to comply by zero discharge. Thus, the combination of the analyses for the two separate compliance approaches yields the aggregate analysis for the final regulation for Subcategory C facilities.

[19] Although the PFPR industry survey focused on facilities using the original 272 PAIs, some of these facilities were also found to use one or more of the additional non-272 PAIs in their PFPR activities. During site visits, EPA also observed PFPR operations at several facilities that process both original 272 and non-272 PAIs. Thus, the set of facilities used for extrapolating financial and technical information to facilities using the non-272 PAI chemicals and the impacts of bringing these additional PAIs under regulation also includes information on facilities that use these non-272 PAIs.

EPA believes this methodology provides a realistic appraisal of the costs and impacts of the final regulation as it embodies the compliance decision that facility management is expected to face in deciding whether to comply by zero discharge or by pollution prevention in combination with treatment followed by discharge. In addition, because EPA's analysis considers both capital and operating costs, EPA believes that the findings from the compliance decision analysis will reasonably approximate facility managements' findings regarding choice of the less financially burdensome compliance approach. In addition, under the final rule, facilities will be able to make the choice between zero discharge and the P2 Alternative on a product family/process line/process unit basis, which will give them even more flexibility in their compliance choice.

2. Estimated Facility Economic Impacts

a. Subcategory C: PFPR and PFPR/ Manufacturers

The costs and impacts for the final regulation applicable to PSES Subcategory C facilities are discussed in this section and are compared with the values estimated for the proposed and supplemental notice regulations. In addition, the cost and impacts for the final regulation are compared with those that EPA estimates would occur if facilities were not provided the flexibility to choose the preferred compliance approach from the zero discharge and pollution prevention allowable discharge alternatives. These comparisons show that the final regulation provides a more economical and less financially burdensome approach to achieving desired discharge reductions than the proposed, and otherwise previously noticed, requirements considered.

The following comparisons with the proposed regulation are relative to the cost and impact values based on the new estimates of the number of facilities using only non-272 PAIs. As noted previously, these revisions increased the costs and impacts estimated for the proposed regulation. The following discussion will show that the costs and impacts for the final regulation are substantially less than the updated estimates for the proposed regulation. Although this discussion will not include comparisons with the values for the proposed regulation as originally published, EPA points out that the costs and impacts for the final regulation are also markedly less than the original estimates of costs and impacts for the proposed regulation.

Of the 2,018 water-using Subcategory C facilities re-estimated to be subject to the regulation at proposal, EPA estimates that 506 facilities, or 25 percent, including baseline failures, will incur costs in complying with the final Subcategory C PSES regulation. Total annualized compliance costs for these facilities are estimated at $29.9 million, in 1995 dollars (see Table 1, below). Excluding baseline closures from the cost analysis reduces the number of facilities expected to incur costs to 421 facilities and total annual costs to $24.2 million, in 1995 dollars. In estimating the costs of the final regulation, facilities were assigned to the compliance option—zero discharge or the pollution prevention alternative—with the lower total annualized compliance cost. From this analysis, 69 percent of the cost-incurring facilities (including baseline failures) were expected to select the P2 Alternative with the remaining 31 percent selecting zero discharge.

No facilities are projected to close under the final regulation. A total of 150 possible line conversions (a moderate impact) are estimated. EPA does not generally expect that line conversions will result in employment losses. However, to be conservative in its analysis, EPA estimated the maximum potential employment loss associated with the regulation by assuming that all PFPR employment would be lost in facilities with line conversions. From this assumption, the upper bound employment loss for the final regulation is estimated at 458 full-time employment positions (FTEs).

TABLE 1.—ESTIMATED COSTS AND IMPACTS OF THE FINAL, PROPOSED AND SUPPLEMENTAL NOTICE PSES REGULATION FOR SUBCATEGORY C FACILITIES

	Number of facilities incurring costs	Total annualized compliance cost ($1995, millions)	Severe impacts †	Moderate impacts *	Maximum potential employment loss ††
Proposed Regulation	1,142	$71.9	3	327	890
Supplemental Notice	709	43.4	0	208	634
Final Regulation—Costs Including Baseline Closures	506	29.9	0	150	458
Final Regulation—Costs Excluding Baseline Closures	421	24.2			

† Severe impacts are defined as facility closures. All facility employment is assumed to be lost as the result of a facility closure.

* Moderate impacts are defined as line conversions and/or total annual compliance costs exceeding 5 percent of total facility revenue. EPA does not expect that employment losses would generally accompany line conversions; however, for this analysis, EPA assessed the maximum potential loss based on the assumption that all employment associated with PFPR activities would be lost as a result of a line conversion.

†† Employment loss for the proposed regulation includes the estimated employment loss in facility closures and the worst case estimate of employment loss in facilities with line conversions. The reported employment loss for the Supplemental Notice and Final Regulation reflects no facility closures and includes only the worst case employment loss in facilities with line conversions.

In addition to presenting the estimated costs and impacts for the final regulation, Table 1 also presents the comparable values for the proposal (re-estimated) and the supplemental notice. As shown in the table, the expected burden of the regulation has fallen considerably from proposal through supplemental notice to the final regulation. From proposal (re-estimated) to final, the number of Subcategory C facilities expected to incur costs has fallen from 1,142 to 506 facilities, or 56 percent [20]. This can be attributed to the reduction in scope of certain PAIs and wastewater sources as well as to the addition of the P2 Alternative as a compliance option to zero discharge. The estimated drop in total annual compliance cost, from $71.9 million to $29.9 million ($1995), represents an even greater reduction from proposal, at 58 percent. As noted above, no severe impacts are assessed for the final regulation while 3 facility closures were estimated for the proposed regulation. Finally, the number of moderate impacts and potential employment losses are also substantially reduced from proposal, falling by 54 percent and 49 percent, respectively. In summary, under the final regulation, the number of facilities estimated to incur costs, the expected cost, and the facility impacts are considerably less than estimated for the proposed regulation.

EPA also believes that the final regulation is superior to the other options considered because of the flexibility it provides to facilities in deciding how to achieve compliance. In particular, by allowing facilities to choose the less expensive compliance approach—the pollution prevention alternative or zero discharge—the regulation achieves substantial pollution reductions but at substantially lower costs and economic impacts than would occur if the regulation allowed compliance by only one of the possible approaches.[21] Moreover, EPA notes that, by encouraging consideration and use of pollution prevention as a compliance approach, the final regulation will reduce the potential for cross-media impacts that would occur under a strict zero discharge requirement. The regulation achieves these benefits with only a very modest reduction in the expected pollutant removals that would be achieved under a zero discharge regulation. Specifically, EPA estimates that the final regulation will remove 189,908 pounds or 98.5 percent, of the estimated 192,789 pounds of pollutant discharges subject to control by the final regulation (assuming zero removals by POTWs currently—see Cost-Effectiveness Analysis in Section V.D.6). EPA estimates that only 2,881 pounds, or about 1.5 percent of the pollutant loadings subject to the final regulation will continue to be discharged to POTWs.

Finding of Economic Achievability

The final regulation achieves substantial reductions in harmful pollutant discharges at very modest economic burden to the PFPR industry. Under a conservative assumption that facilities will recover none of their compliance costs through price increases, the regulation is estimated to impose no severe impacts (i.e., facility closures), 150 moderate impacts (i.e., line conversion or annualized compliance cost exceeding 5 percent of facility revenue), and a worst-case employment loss of 458 FTEs. In addition, the final regulation provides industry with considerable latitude in deciding how to comply with the regulation—that is, by zero discharge or pollution prevention and treatment. In this regard, EPA's analyses of the selected compliance approach may overstate compliance costs because the analyses assume application of one approach throughout the facility instead of a more customized choice of compliance approach by PFPR line. Also, EPA estimates that a relatively small fraction—25 percent—of the facilities potentially subject to the proposed regulation are likely to incur costs in complying with the final regulation. That such a small fraction of the industry is expected to incur costs reflects in large part EPA's decision to exclude additional PAIs and wastestreams from coverage under the final regulation. Finally, EPA notes that the aggregate costs and impacts estimated for the final regulation are substantially less than those estimated for the proposed regulation, both as analyzed for the original proposal and as analyzed on the basis of the higher estimate of non-272 PAI-using facilities. In light of these very modest impacts estimated for the final regulation, EPA finds that the final PSES regulation for Subcategory C facilities is economically achievable.

b. Subcategory E: Refilling Establishments

The regulatory approach and costing methodology for Subcategory E facilities is unchanged from that presented at proposal with the exception that storm water is no longer considered a process wastewater subject to this regulation. The analysis of costs, loadings, and economic methodology at proposal stands as previously presented.

[20] All comparisons with the proposed regulation and supplemental notice are based on the analyses including baseline closures.

[21] EPA has worded the final regulation to allow facilities to make the choice between zero discharge and the pollution prevention alternative on a product family/process unit/process line basis (as opposed to a full facility basis). However, EPA could not estimate costs on this basis.

EPA is establishing BPT and BAT regulations for Subcategory E facilities set to zero discharge (equivalent to PSES). EPA's survey of the PFPR industry indicated that no Subcategory E facilities are direct dischargers. Accordingly, EPA estimates that the Subcategory E portion of the PFPR industry will incur no costs for complying with the BPT or BAT requirements.

4. Regulatory Effects Not Re-Estimated

Because the aggregate compliance costs and facility impacts estimated under the final regulation are substantially less than those estimated for the regulation as presented at proposal, EPA did not re-evaluate the following economic measures for the final regulation: community impacts, foreign trade effects, impacts on firms owning PFPR facilities, the direct economic benefits to facilities of pollution prevention practices, and the labor requirements. The analysis of these additional impact categories depends on the estimated aggregate costs for the regulation and on the results of the facility impact analysis. With the final regulation estimated to impose aggregate compliance costs that are 56 percent less than originally estimated for the proposed regulation and to cause no facility closures (compared to the 2 closures originally estimated at proposal), EPA concluded that the analysis for these additional impact categories under the final regulation would find less consequential effects than had been originally estimated at proposal. Because EPA had judged the slight impacts estimated at proposal for the additional impact categories to be consistent with an economically achievable regulation, EPA, therefore, concluded that the impacts under the final regulation for these additional impact categories would also be found consistent with an economically achievable regulation. As a result, EPA decided not to expend the resources that would be necessary to re-estimate and re-document the lower impact levels for these additional impact categories.

5. Impacts of Pretreatment Standards for New Sources (PSNS) and New Source Performance Standards (NSPS)

a. Subcategory C: PFPR and PFPR/ Manufacturers

(1) PSNS

EPA is setting PSNS (Pretreatment Standards for New Sources) for Subcategory C facilities equal to PSES limitations for existing sources. In general, EPA believes that new sources will be able to comply at costs that are similar to or less than the costs for existing sources, because new sources can apply control technologies and P2 practices (including dedicated lines and pressurized hoses for equipment cleaning) more efficiently than sources that need to retrofit for those technologies and P2 practices. As a result, given EPA's finding of economic achievability for the final PSES regulation for Subcategory C facilities, EPA also finds that the PSNS regulation will be economically achievable and will not constitute a barrier to entry for new sources.

(2) NSPS

EPA has established NSPS limitations equivalent to the limitations that are established for BPT and BAT. BPT and BAT limitations allow facilities to use the Zero/P2 Alternative and were found to be economically achievable; therefore, NSPS limitations will not present a barrier to entry for new facilities.

b. Subcategory E: Refilling Establishments

EPA is setting NSPS/PSNS for Subcategory E facilities equal to BAT/ PSES limitations for existing sources. EPA estimates that compliance with BAT/PSES will impose no costs on existing facilities. Likewise, new facilities are not expected to incur additional annual costs due to the regulation. Because EPA found compliance with the final regulation to be economically achievable for existing facilities, EPA determined that compliance with NSPS/PSNS will also be economically achievable and not a barrier to entry for new sources.

6. Cost-Effectiveness Analysis

EPA also performed a cost-effectiveness analysis of the final PSES regulation for Subcategory C facilities. (A more detailed discussion can be found in the final Cost-Effectiveness Analysis (September 1996) [EPA–821–R–96–018]. The cost-effectiveness analysis compares the total annualized cost incurred for a regulatory option to the corresponding effectiveness of that option in reducing the discharge of pollutants.

Cost-effectiveness calculations are used during the development of effluent limitations guidelines and standards to compare the efficiency of one regulatory option in removing pollutants to another regulatory option. Cost-effectiveness is defined as the incremental annual cost of a pollution control option in an industry subcategory per incremental pollutant removal. The increments are considered relative to another option or to a benchmark, such as existing treatment. In cost-effectiveness analysis, pollutant removals are measured in toxicity normalized units called ''pounds-equivalent.'' The cost-effectiveness value, therefore, represents the unit cost of removing an additional pound-equivalent (lb eq.) of pollutants. In general, the lower the cost-effectiveness value, the more cost-efficient the regulation will be in removing pollutants, taking into account their toxicity. While not required by the Clean Water Act, cost-effectiveness analysis is a useful tool for evaluating regulatory options for the removal of toxic pollutants. Cost-effectiveness analysis does not analyze the removal of conventional pollutants (e.g., oil and grease, bio-chemical oxygen demand, and total suspended solids).

For the cost-effectiveness analysis, the estimated pounds-equivalent of pollutants removed were calculated by multiplying the number of pounds of each pollutant removed by the toxic weighting factor for each pollutant. The more toxic the pollutant, the higher will be the pollutant's toxic weighting factor; accordingly, the use of pounds-equivalent gives correspondingly more weight to pollutants with higher toxicity. Thus, for a given expenditure and pounds of pollutants removed, the cost per pound-equivalent removed would be lower when more highly toxic pollutants are removed than if pollutants of lesser toxicity are removed. Annual costs for all cost-effectiveness analyses are reported in 1981 dollars so that comparisons of cost-effectiveness may be made with regulations for other industries that were issued at different times.

a. Subcategory C: PFPR and PFPR/ Manufacturers

Table 2 provides estimates of the total annualized compliance costs, in 1981 dollars, the total pollutant removals in pounds and pounds-equivalent, and the cost-effectiveness of the final PSES regulation for Subcategory C facilities with estimates of various POTW removals. EPA has estimated the pollutant removals and the cost-effectiveness value for the final rule using the same methodology as used in the proposed rule and supplemental notice (and the Pesticide Manufacturing effluent guideline). This methodology assumes that all PAIs pass through the POTW (i.e., no removal by the POTW), as there is little field data on the effectiveness of POTWs removing PAIs.

However, EPA has developed laboratory estimates for the percent

removals of a large number of pollutants (including some PAIs) which were published in the Domestic Sewage Study (DSS), February 1986 [EPA/530–SW–86–004]. For each pollutant studied, two estimates were developed, an ''acclimated'' removal percentage, which might be achieved by a well-run treatment facility with a constant flow rate of the pollutant in question, and an ''unacclimated'' removal percentage, adjusted to account for the slug loadings and batch discharges which POTWs experience in everyday operation. While the unacclimated removals were intended to more accurately reflect real world operating conditions, a limited amount of test data on non-PAI pollutants indicates that POTWs may achieve or even exceed the acclimated removal estimates in practice. Thus it is not clear whether the acclimated or unacclimated estimates more accurately represent the removal percentages achieved in practice for PAIs. EPA has thus developed a range of cost-effectiveness and total removals using three different assumptions about the removal efficiency of POTWs: zero removals (this most conservative estimate is included because of the lack of actual data), unacclimated removals (which range from 30% to 90% and average 48%), and acclimated removals (which range from 80% to 95%).

Using this range of POTW removals, EPA has estimated the range of removal to be between 18,991 and 189,908 pounds of pollutants, or 760,000 to 7.6 million toxic pounds-equivalent with cost-effectiveness ranging from $2.74 to $27.35 per pound-equivalent when compliance costs are held constant at $20.9 million [22] in 1981 dollars. EPA considers even the high end of this range to be cost effective. In order to be consistent with the proposed rule and supplemental notice (and because of the lack of actual POTW removal data for PAIs), EPA is presenting the cost-effectiveness and total removals for the final rule as $2.74 per pound-equivalent and 189,908 pounds or 7.6 million pounds-equivalent, respectively.

TABLE 2.—NATIONAL ESTIMATES OF TOTAL ANNUALIZED COSTS, REMOVALS AND COST-EFFECTIVENESS VALUES FOR SUBCATEGORY C PSES FACILITIES UNDER THE FINAL REGULATION

POTW removal assumption used	Total annualized compliance costs (millions of $, 1981)	Pollutant removals, pounds	Pollutant removals, (pounds-equivalent)	Cost-effectiveness ($/lb.-eq.)
No POTW Removals	$20.9	189,908	7.6 million	$2.74
POTW Removals per DSS	20.9	165,460	5.8 million	3.60
90 Percent Removal Efficiency	20.9	18,991	760,000	27.35

Notes:
1. Includes estimated baseline failures.
2. Toxic weighting factors used in the analyses reflect more recent toxicological information and are generally lower than the factors used at proposal and supplemental.

EPA has also estimated the removals, annual compliance cost, and cost-effectiveness excluding baseline closures (when zero removal at POTWs is assumed). Excluding estimated baseline failures lowers the costs and removals to $17.1 million ($1981) and 156,592 pounds (5.8 million pounds-equivalent). The cost-effectiveness value excluding baseline failures is $2.93 per pound-equivalent, which EPA considers to be cost-effective.

The cost-effectiveness value (assuming no POTW removal) for the final regulation is not directly comparable to the values presented in the previous Federal Register notices for the proposed regulation and the supplemental notice for two reasons. First, the scope of the regulation has changed with fewer PAIs and waste streams covered under the final regulation. As a result, the baseline pollutant discharges and pollutant removals estimated for the final regulation are lower than the values estimated for the proposed regulation. Second, the toxic weighting factors (TWFs) used by EPA for calculating the cost-effectiveness of the final regulation reflect more recent toxicological data and, in general, are lower than the values used for the proposal and supplemental notice analyses. To provide a consistent comparison of the proposed, supplemental, and final regulations, EPA re-calculated the toxic-weighted baseline discharges, pollutant removals, and cost-effectiveness values for the proposed and supplemental notice regulations using the more recent toxic weighting factors (see Table 3).[23] The calculations for the final regulation also embody the changes in regulatory scope.

TABLE 3.—ESTIMATED COST-EFFECTIVENESS OF THE FINAL PSES REGULATION FOR SUBCATEGORY C FACILITIES COMPARED WITH THE PROPOSED AND SUPPLEMENTAL NOTICE REGULATIONS

[All toxic-weighted values based on toxic weighting factors developed for the Final Regulation]

	Proposed regulation: Zero discharge with sanitizer exemption (Option 3/S.1)	Supplemental notice: Zero discharge/pollution prevention alternative	Final regulation: Zero discharge/pollution prevention alternative
Total Annualized Cost, $1981	$64.1 million	$32.7 million	$20.9 million.
Pollutant Discharges Subject to Regulation, pounds	505,235	337,995	192,789.
Pollutant Loadings Subject to Regulation, pounds-equivalent	23.2 million	15.4 million	7.7 million.
Pollutant Removals, pounds	503,114	333,731	189,908.

[22] EPA believes that if POTWs are removing PAIs, the cost of compliance of the industry would be lower than $20.9 million ($1981) due to the reduction in operating and maintenance costs associated with the treatment system used to pretreat PFPR wastewaters prior to discharge to the POTW.

[23] The re-calculated cost-effectiveness values for the proposed regulation also reflect the updated estimates of the number of facilities using non-272 PAIs.

TABLE 3.—ESTIMATED COST-EFFECTIVENESS OF THE FINAL PSES REGULATION FOR SUBCATEGORY C FACILITIES COMPARED WITH THE PROPOSED AND SUPPLEMENTAL NOTICE REGULATIONS—Continued

[All toxic-weighted values based on toxic weighting factors developed for the Final Regulation]

	Proposed regulation: Zero discharge with sanitizer exemption (Option 3/S.1)	Supplemental notice: Zero discharge/pollution prevention alternative	Final regulation: Zero discharge/pollution prevention alternative
Pollutant Removals, pounds-equivalent	23.2 million	15.3 million	7.6 million.
Cost-Effectiveness‡	$2.77/lb-eq	$2.14/lb-eq	$2.74/lb-eq.

AAA‡Cost-effectiveness analysis is conventionally calculated on an incremental basis: that is, the costs and removals of a given option are calculated as the differences from the values for the next less stringent option. At proposal, the cost-effectiveness of Option 3/S.1 was calculated on an incremental basis relative to the next less stringent option, Option 3/S. However, the cost-effectiveness values for the supplemental notice and final regulations are relative to a next less stringent option of no regulation. To permit consistent comparison of the three regulations, the cost-effectiveness of the proposed regulation has been restated relative to a no-regulation baseline.

The effect of the regulation's reduced scope is seen by the reductions in pollutant loadings subject to regulation in pounds and pounds-equivalent (see Table 3, lines 2 and 3). These results show the pollutant loadings subject to the rule at proposal to be 505,235 pounds, and on a toxic-weighted basis, 23.2 million pounds-equivalent; under the final regulation, the pollutant loadings within the scope of the regulation fall to 192,789 pounds and 7.7 million pounds-equivalent on a toxic-weighted basis. The cost-effectiveness values of the regulations using the current set of weighting factors are: $2.77 per pound-equivalent for the proposed regulation, $2.14 per pound-equivalent for the supplemental notice, and $2.74 per pound-equivalent for the final regulation. The cost-effectiveness value for the final regulation is low in relation to the values calculated for other effluent limitations guidelines and standards recently promulgated by EPA.

b. Subcategory E: Refilling Establishments

Estimates of compliance costs and pollutant removals associated with Subcategory E facilities have not changed since the proposed regulation. EPA believes that the final regulation can be implemented at a minimal cost (i.e., a capital investment of approximately $500 for a mini-bulk tank to store water for reuse) at the 19 facilities not currently in compliance. Therefore, EPA determines the final regulation to be cost-effective for Subcategory E facilities.

E. Regulatory Flexibility Act

Pursuant to section 605(b) of the Regulatory Flexibility Act, 5 U.S.C. 605(b), the Administrator certifies that this rule will not have a significant economic impact on a substantial number of small entities. EPA analyzed the potential impact of the rule on both small businesses and small local governments.

Under the Regulatory Flexibility Act, an agency is not required to prepare a regulatory flexibility analysis for a rule that the agency head certifies will not have a significant economic impact on a substantial number of small entities. While the Administrator has so certified today's rule, the Agency nonetheless prepared a regulatory flexibility assessment equivalent to that required by the Regulatory Flexibility Act as modified by the Small Business Regulatory Enforcement Fairness Act of 1996. The assessment for this rule is detailed in the ''Economic Analysis of Final Effluent Limitations Guidelines and Standards for the Pesticide Formulating, Packaging, and Repackaging Industry'' [EPA–821–R–96–017].

EPA received many comments regarding the rule (see Section 15.6 of the technical record and Section IV in the economic record for the rulemaking). A number of commenters raised issues concerning small business impacts and the need to reduce the regulation's burden on small businesses. Specifically, as a way of reducing possible adverse impacts on smaller businesses, some commenters requested that EPA broaden its exemption from the regulation to include all small businesses. In addition, some commenters argued that EPA did not need to regulate the discharges of small PFPR businesses because the pollutant discharges of such facilities were not likely to have a consequential environmental impact.

EPA disagrees with this claim and believes it is inappropriate to set small-business and/or small-production exemptions for all small businesses and/or production volumes because of the substantial toxicity of many of the PAIs. The size of the business and/or the volume of PAIs processed annually are not a sufficient basis for determining that a facility should be exempted from regulation. Because of the high toxicity of many of the PAIs, the processing of even very small quantities of such PAIs can result in pollutant discharges of substantial toxicity. In addition, small business size does not necessarily equate with small pesticide production volume, particularly in terms of toxicity. Some small-business PFPR facilities process a substantial volume of PAIs and have the potential to discharge substantial volumes of toxic pollutants unless discharges are limited by the PFPR regulation. (see the Comment Response Documents in the rulemaking record for more information on these comments and EPA's response to them.)

Taking into account commenters'' concerns regarding possible impacts on small entities, EPA introduced the Zero/P2 Alternative Option and made numerous changes to the rule designed to reduce the burden upon all PFPR facilities, particularly small business entities. As previously discussed, the final rule expands the sanitizer exemption to exempt additional lower toxicity PAIs from regulatory coverage and gives facilities a Zero/P2 compliance choice on a line by line or process by process basis.

The factual analysis and basis for the ''no significant impact'' certification is contained in Chapter 4 of the final EA report referenced previously and is summarized below.

1. Analysis of Impacts on Small Business Entities

To gauge the impact of the final regulation on small business, EPA analyzed the impact of the final regulation on Subcategory C facilities according to the business size of the owning firms and compared the findings for the final regulation with those for the proposed regulation. Given the large presence of small business-owned entities in the PFPR industry, EPA exercised substantial care at proposal and throughout development of the final regulation, to ensure that the

final regulation would not impose a significant impact on a substantial number of small business-owned facilities. This effort results in the modest incurrence of both costs and impacts by small business entities under the final regulation.

EPA estimates that 1,513 (75.0 percent) of the 2,018 PFPR facilities potentially subject to a Subcategory C PSES regulation are owned by small entities. Of the 506 facilities estimated to potentially incur compliance costs under the final rule (including baseline failures), 357 (70.6 percent) are estimated to be owned by small entities. Excluding projected baseline failures, 421 facilities are expected to incur costs, of which 274, or 65.1 percent are small business-owned facilities.

No small business-owned facilities are estimated to close as a result of regulation. Less than 10 percent of small business-owned facilities (137 facilities) are estimated to incur a moderate impact '' that is, a line conversion or annualized compliance cost exceeding 5 percent of facility revenue. The average compliance cost burden among small business-owned facilities is also small in relation to facility revenue: on average, annualized compliance costs amount to 2.7 percent of facility revenue for small business-owned facilities.

Finally, the number of small business-facilities incurring costs, and the numbers of small business-facilities incurring severe or moderate impacts are substantially less than estimated for the proposed regulation. For the proposed regulation (re-estimated), 859 small business-facilities were estimated to incur costs, 3 facilities were assessed as potential closures (severe impacts), and 275 facilities were assessed as moderate impacts; the comparable values for the final regulation are 357 small-business facilities incurring costs, zero severe impacts, and 137 moderate impacts. The substantial reduction in impacts among small business-owned facilities from proposed to final regulation reflects EPA's efforts to moderate the burden of the regulation by introducing a new option which gives facilities the two compliance alternatives, by reducing the PAIs and wastestreams subject to the regulation, and by providing facilities with greater flexibility in deciding how to achieve regulatory compliance. In light of these findings, EPA certifies that the final regulation does not impose significant impacts on a substantial number of small business-owned facilities.

2. Analysis of Impacts on Other Small Entities

In addition to considering the impact of the final regulation on small business-owned facilities, EPA also considered the regulation's likely effects on two other categories of small entities that will be affected by the regulation: (1) Publicly Owned Treatment Works operated by small governments, which may be responsible for implementing the regulation at the local level; and (2) small communities, which may contain businesses that are adversely affected by the regulation. EPA concluded that the final regulation would not impose significant impacts on either of these additional small entity categories.

In the course of developing the final regulation, EPA solicited comments on regulatory implementation issues from over 76 POTWs that had been identified as receiving PFPR facility discharges. Fifteen of these are POTWs are considered small—that is, POTWs that are located in smaller jurisdictions (less than 50,000 population) or that are small POTWs on the basis of daily treatment volume (less than or equal to 1 million gallons per day). Comments were requested on such matters as the burden of implementing the pollution prevention/treatment alternative element of the regulation. Although small entity POTWs were afforded the opportunity to comment on the implementation requirements of the proposed regulation, none chose to do so. However, in response to the request for comment on the supplemental notice, EPA received responses from eight POTWs. Several of these comments indicated that POTWs might face modestly higher burdens from administering a regulation with the compliance flexibility offered by the P2 Alternative than from administering a regulation strictly based on zero discharge. However, none indicated that such a regulation would be expected to impose a significant additional burden beyond the requirements that POTWs already face in administering permits and compliance programs for industrial facilities. In addition, POTWs also indicated that the modest additional burden seemed reasonable given the regulation's expected discharge reductions and its innovative structure, which gives facilities greater flexibility in designing a compliance approach and which encourages use of pollution prevention as a compliance method. In view of these responses and given the fact that no small entity POTWs responded to the request for comments, EPA certifies that the regulation will not impose a significant impact on a substantial number of small entity POTWs.

In addition to the analysis required by the Regulatory Flexibility Act, EPA also considered the regulation's effect on small communities in which PFPR facilities might be located. Specifically, in the community impact analysis performed for the proposed PFPR regulation, EPA examined the impact of possible employment losses, including multiplier effects, in communities in which PFPR facilities with moderate or severe impacts were located. Using the criterion that an estimated aggregate employment loss exceeding one percent of community employment is significant, EPA found no significant community employment impacts for the proposed regulation as originally analyzed. At the same time, the final regulation is estimated to have substantially fewer facility and employment impacts than those estimated for the original proposed regulation. Given that no significant community impacts were found among any communities for the original proposed regulation—regardless of community size—5and that the final regulation's impacts are expected to be substantially less than those of the proposed regulation, the final regulation will not impose a significant burden on small communities.

VI. Unfunded Mandates Reform Act

Title II of the Unfunded Mandates Reform Act of 1995 (UMRA), Pub. L. 104–4 establishes requirements for Federal agencies to assess the effects of their regulatory actions on State, local, and tribal governments and the private sector. Under Section 202 of the UMRA, EPA generally must prepare a written statement, including a cost-benefit analysis, for proposed and final rules with ''Federal mandates'' that may result in expenditures to State, local, and tribal governments, in the aggregate, or to the private sector, of $100 million or more in any one year. Before promulgating an EPA rule for which a written statement is needed, Section 205 of the UMRA generally requires EPA to identify and consider a reasonable number of regulatory alternatives and adopt the least costly, most cost-effective or least burdensome alternative that achieves the objectives of the rule. The provisions of Section 205 do not apply when they are inconsistent with applicable law. Moreover, Section 205 allows EPA to adopt an alternative other than the least costly, most cost-effective or least burdensome alternative if the Administrator publishes with the final rule an explanation why that alternative was not adopted. Before EPA establishes

any regulatory requirements that may significantly or uniquely affect small governments, including tribal governments, it must have developed under Section 203 of the UMRA a small government agency plan. The plan must provide for notifying potentially affected small governments, enabling officials of affected small governments to have meaningful and timely input in the development of EPA regulatory proposals with significant Federal intergovernmental mandates, and informing, educating, and advising small governments on compliance with the regulatory requirements.

EPA has determined that this rule does not contain a Federal mandate that may result in expenditures of $100 million or more for State, local, and tribal governments, in the aggregate, or the private sector in any one year. Thus, today's rule is not subject to the requirements of Sections 202 and 205 of the UMRA.

Although not subject to the UMRA because the cost of the rule to all parties that would be effected is well below $100 million, EPA has complied with numerous provisions of the UMRA. Today's rule is the least costly, least burdensome alternative that was considered.

Consistent with the intergovernmental consultation provisions, EPA has already initiated consultations with the Publicly Owned Treatment Works (POTWs) that will be affected by the rule and sought their input as part of the regulation development process. Specifically, after publication of the Supplemental Notice (60 FR 30217), EPA solicited comments from over 70 POTWs that had been identified as receiving discharges from PFPR facilities. This request sought input on several aspects of the PSES regulation, including allowance of self-certification of compliance by PFPR facilities, use of Best Professional Judgment to revise or modify the pollution prevention practices listed in the Supplemental Notice, and the burden on POTWs from administering the pollution prevention compliance alternative as part of the regulation proposed in the Supplemental Notice.

In response to this request, EPA received comments from eight POTWs. Four of these included comment on the expected burden to POTWs from administering the pollution prevention and treatment compliance alternative. The general thrust of these comments is that administering the pollution prevention/treatment alternative will impose somewhat higher burdens on POTWs than administering a regulation requiring compliance strictly by zero discharge. POTWs stated that inspection requirements for verification of compliance will be more difficult and time-consuming because inspectors will have to review technical plans, equipment, and processes to verify that the specified pollution prevention and treatment measures have been properly implemented, maintained, and operated by PFPR facilities. In contrast, verification of compliance with a zero discharge regulation would be more straightforward. POTWs also stated that the option of relying on Best Engineering Judgment to alter requirements on facilities would increase, rather than reduce, implementation burdens. However, at the same time, POTWs also noted that the burden of administering the PFPR regulation did not seem unreasonable in comparison to requirements for other regulations and that the regulation's implementation requirements are necessary if the regulation is to be effective.

In keeping with the provisions to inform, educate, and advise small governments, EPA will publish a Guidance Manual prior to the compliance deadline of the rule to inform, educate, and advise interested facilities, permit writers, and POTWs on pollution prevention processes and procedures applicable to the PFPR industry. It will also serve as guidance for the implementation of and compliance with the P2 Alternative requirements.

VII. Executive Order 12866

Under Executive Order 12866, (58 FR 51735 (October 4, 1993)) the Agency must determine whether the regulatory action is ''significant'' and therefore subject to OMB review and the requirements of the Executive Order. The Order defines ''significant regulatory action'' as one that is likely to result in a regulation that may:

(1) Have an annual effect on the economy of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities;

(2) Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;

(3) Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or

(4) Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order.

Pursuant to the terms of Executive Order 12866, it has been determined that this rule is a ''significant regulatory action.'' As such, this action was submitted to OMB for review. Changes made in response to OMB suggestions or recommendations will be documented in the public record for this rulemaking.

VIII. Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA)

Under 5 U.S.C. 801(a)(1)(A) as added by the Small Business Regulatory Enforcement Fairness Act of 1996, EPA submitted a report containing this rule and other required information to the U.S. Senate, the U.S. House of Representatives and the Comptroller General of the General Accounting Office prior to publication of the rule in today's Federal Register. This rule is not a ''major rule'' as defined by 5 U.S.C. 804(2).

IX. Paperwork Reduction Act

The information collection requirements in this rule have been submitted for approval to the Office of Management and Budget (OMB) under the Paperwork Reduction Act, 44, U.S.C. 3501 et seq. Two separate Information Collection Request (ICR) documents have been prepared by EPA. Burden estimates for PFPR direct dischargers to comply with their NPDES permits and the P2 Alternative are contained in the ''National Pollutant Discharge Elimination System (NPDES)/ Compliance Assessment/Certification Information'' ICR (No.1427.05). Burden estimates for indirect discharging PFPR facilities to comply with 40 CFR part 403 and the P2 Alternative are included in the ''National Pretreatment Program (40 CFR part 403)'' ICR (No. 0002.08). The approval of these ICRs is still pending; therefore, the information requirements contained in this rule are not effective until OMB approves them. A copy of these ICRs may be obtained from Sandy Farmer, OPPE Regulatory Information Division; U.S. Environmental Protection Agency (2136), 401 M St., NW., Washington, DC 20460, by calling (202) 260–2740, or electronically by sending an e-mail message to ''farmer.sandy@epamail.epa.gov''.

Burden means the total time, effort, or financial resources expended by persons to generate, maintain, retain, or disclose or provide information to or for a Federal agency. This includes the time needed to review instructions; develop, acquire, install, and utilize technology and systems for the purposes of collecting, validating, and verifying information, processing and

maintaining information, and disclosing and providing information; adjust the existing ways to comply with any previously applicable instructions and requirements; train personnel to be able to respond to a collection of information; search data sources; complete and review the collection of information; and transmit or otherwise disclose the information.

EPA estimates that each water using facility is expected to spend an average of 20 to 60 hours preparing the initial certification statement (including brief descriptions) for submittal to the permitting/control authority as well as preparing the paperwork to be kept on-site (i.e., treatment information, supporting documentation for modifications, etc. . .). EPA has estimated less hours for direct dischargers than for the indirect dischargers (i.e., 20 hours versus 60 hours) because the direct dischargers are typically also pesticide manufacturers with treatment systems in place that are well documented while most indirect dischargers do not have treatment in place and have less technical expertise in the area of wastewater treatment. However, some indirect dischargers will use less than the 60 hours because they are also pesticide manufacturers or they may be able to reuse all of their wastewater that would otherwise have to be pretreated prior to discharge to the POTW (i.e., interior wastewater sources, floor wash and/or leak and spill cleanup water).

Note: Although most indirect dischargers will not implement the P2 Alternative prior to the compliance deadline (3 years following promulgation) and; therefore would not be covered by the Pretreatment ICR (No. 0002.08) which expires in three years, EPA has estimated that approximately ten percent of the 1500 water-using PFPR facilities/new facilities (i.e., 150 facilities) would implement the P2 Alternative prior to the compliance deadline. Therefore, the burden presented in the Pretreatment ICR concerning the P2 Alternative is estimated for 150 facilities over the 3 years of the ICR. EPA will include burden for the remainder of the water using PFPR facilities in the subsequent Pretreatment ICR in 1999.

Beyond the initial submittal, a PFPR facility is expected to spend 15 minutes to prepare and sign the periodic certification statement to be submitted to the permitting authority once per year and to the control authority twice per year. If a facility has made changes in the P2 practices they are using or in the choice of zero discharge or P2 Alternative for a process line/product family that was initially specified in the initial certification (or previous period), they must provide a brief description with their periodic certification statement. EPA assumes that ten percent of facilities will have to prepare such a description each year and that the associated burden/facility is four hours for direct dischargers and 10 hours for indirect dischargers. EPA has also included four hours per facility for direct dischargers and 10 hours for indirect dischargers for the burden associated with a request for approval of modifications where the justification is not listed on Table 8 to part 455 of the final regulation. Again, EPA has used the assumption that ten percent of facilities per year will have to prepare such a request for modification.

An Agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. The OMB control numbers for EPA's regulations are listed in 40 CFR part 9 and 48 CFR Chapter 15.

Send comments on the burden estimates and any suggested methods for minimizing respondent burden, including through the use of automated collection techniques to EPA at the address provided above, with a copy to the Office of Information and Regulatory Affairs, Office of Management and Budget, 725 17th St., NW., Washington, DC 20503, marked ''Attention: Desk Officer for EPA.'' Please remember to include the ICR number in any correspondence.

X. Water Quality Analysis

Most of the PAIs being regulated have at least one toxic effect (e.g., human health carcinogen and/or systemic toxicant or aquatic toxicant). Many of these pollutants have the potential to bioaccumulate and persist in the environment. Various studies have demonstrated the bioaccumulation of pesticides in aquatic life and accumulation of pesticides in sediments. Documented human health impacts at pesticide formulating, packaging, and repackaging (PFPR) facilities include respiratory disease and impaired liver function, primarily through worker exposure.

For example, 137 of the original 272 PAIs are known to be highly or moderately toxic to aquatic life, 25 have carcinogenic effects, 149 are known to have systemic or other health effects, 24 have an established concentration limit under the Safe Drinking Water Act and 134 have a high or moderate potential to bioaccumulate in the environment. (See the ''Potential Fate and Toxicity Categorization of Pollutants Associated with PFPR Wastewater'' Report; September 1996 in the rulemaking record).

Numerous incidents of groundwater and soil contamination at refilling establishments, largely due to spills, are identified in the Office of Pesticide Programs proposed ''Standards for Pesticide Containers and Containment'' (59 FR 6712, February 11, 1994). Several examples cited in the Standards for Pesticide Containers and Containment proposed rule are summarized below.

Based on the 1991 study, ''Report on Wisconsin Pesticide Mixing and Loading Site Study,'' an estimated 45 to 75 percent of the commercial agrichemical facilities in Wisconsin will require soil remediation and 29 to 63 percent of these sites potentially exceed the State's groundwater standards for pesticides. In the ''Environmental Cleanup of Fertilizer and Agricultural Chemical Dealer Sites'' report, the Iowa Fertilizer and Chemical Association estimates that 40 to 50 percent of refilling establishments in Iowa may require groundwater remediation. A 1992 letter from the National Agricultural Retailers Association (formerly NARA, now ARA) stated that 70 to 80 percent of the detections of pesticides in groundwater in Kansas could be traced back to refilling establishments. Groundwater contamination by pesticides is also documented at numerous refilling establishments in Michigan, Minnesota, Illinois, and Utah.

The water quality benefits of controlling the indirect discharges from PFPR facilities are evaluated by modeling the impact of those discharges on receiving streams. This model assumes that no additional removal occurs at the POTW. EPA believes this to be a valid assumption because the PAIs that are still covered by the scope of the final pretreatment standards (PSES) are expected to pass-through POTWs. The effects of POTW wastewater discharges of 139 PAIs are evaluated at current and post-compliance (e.g., zero/P2 Alternative) levels for 85 indirect discharging PFPR facilities which discharge to 79 POTWs on 77 receiving streams. Water quality models are used to project pollutant instream concentrations based on estimated releases at current and zero/P2 Alternative levels; the instream concentrations are then compared to EPA published water quality criteria or to documented toxic effect levels.

The instream pollutant concentration for one PAI is projected to exceed human health criteria in two receiving streams at current discharge levels. Both excursions are projected to be eliminated under the zero/P2 Alternative. The number of pollutants with receiving streams projected to

exceed aquatic life criteria or aquatic toxic effect levels would be reduced from 21 PAIs in 23 streams at current discharge levels to four PAIs in six streams at zero/P2 Alternative levels.

The potential impacts of these indirect discharging PFPR facilities are also evaluated in terms of inhibition of POTW operation and contamination of sludge. Potential biological inhibition problems are projected to occur for current discharges at four POTWs for three PAIs; sludge criteria are unavailable for PAIs. No potential biological inhibition problems are projected to occur for the Zero/P2 Alternative option. The POTW inhibition values used in this analysis are not, in general, regulatory values. They are based upon engineering and health estimates contained in guidance or guidelines published by EPA and other sources. Thus, EPA is not basing its regulatory approach for pretreatment discharge levels upon the finding that some pollutants interfere with POTWs by impairing their treatment effectiveness. However, the values used in the analysis do help indicate the potential benefits for POTW operation that may result from the compliance with the final regulation.

In addition, the water quality benefits of controlling the direct discharges from PFPR facilities were evaluated by modeling the impact of direct wastewater discharges on receiving stream water quality. However, as described in Section IV.C.1 of today's notice, EPA's estimates of costs and current pollutant loadings for direct discharges did not include pollutant removals for treatment already in place (i.e., pesticide manufacturing treatment systems). Therefore, an estimate of the water quality impacts resulting from current direct discharges would result in an overestimation of the current water quality impacts because these facilities do have treatment in place and are already meeting zero discharge or zero allowance (i.e., no additional discharge allowance in the pesticide manufacturers' limitations for PFPR wastewaters). Thus, EPA is presenting only those water quality impacts associated with the final rule.

Seventeen (17) direct discharging PFPR facilities, which discharge 61 PAIs to 16 receiving streams, were evaluated. Water quality models are used to project pollutant instream concentrations based on estimated releases at post-compliance (e.g., zero/P2 Alternative) levels; the instream concentrations are then compared to EPA published water quality criteria or to documented toxic effect levels where EPA water quality criteria are not available for certain PAIs. The zero/P2 Alternative option is projected to result in aquatic life exceedances of three PAIs in two receiving streams. No exceedances of human health criteria are projected to occur for the zero/P2 Alternative option.

XI. Non-Water Quality Environmental Impacts

The elimination or reduction of one form of pollution may create or aggravate other environmental problems. Therefore, Sections 304(b) and 306 of the Act call for EPA to consider the non-water quality environmental impacts of effluent limitations guidelines and standards. Accordingly, EPA has considered the effect of these regulations on air pollution, solid waste generation, and energy consumption. As discussed throughout today's notice, EPA selected to promulgate the Zero/P2 Alternative option due to the cross-media impacts that could occur under a zero discharge regulation due to contract hauling to off-site incineration of potentially large volumes of non-reusable wastewaters.

EPA has estimated the non-water quality impacts associated with the selected option, i.e., the Zero/P2 Alternative, as well as a zero discharge option. As discussed previously in this notice, under the Zero/P2 Alternative, facilities will be able to choose between complying with zero discharge or the P2 Alternative on a line-by-line basis. However, for the purposes of estimating compliance costs and non-water quality impacts, EPA has assumed that a facility will choose between these compliance options on a whole-facility basis. Therefore, the non-water quality estimates for the Zero/P2 Alternative represent those cross-media impacts associated with a percentage of the facilities choosing to comply with the P2 Alternative and others choosing to comply with zero discharge.

EPA has used the assumption that, under the zero discharge option, facilities would recycle and reuse some wastewaters while hauling the remaining wastewaters off-site for incineration. Under the P2 Alternative portion of the Zero/P2 Alternative, some facilities may be able to avoid the need for wastewater treatment by comprehensively applying source reduction practices to all their wastewater sources; however, it is more likely that, following the use of recycle and reuse practices, facilities will need to employ some pollution control treatment technologies prior to discharging their wastewaters.

There are some cross-media impacts that are associated with the Zero/P2 Alternative and its use of a wastewater treatment system that are not associated with a zero discharge option since treatment is not utilized under the zero discharge option. These cross-media impacts include sludge generation and energy consumption and air emissions of criteria air pollutants [24] from the trucks that transport spent activated carbon for regeneration. However, the zero discharge option relies heavily on the contract hauling of wastewater for incineration which significantly increases the cross-media impacts due to air emissions of criteria air pollutants from the trucks that transport the wastewater to incineration and from the incineration of the wastewater itself.

EPA believes that selecting the Zero/P2 Alternative option will minimize these cross-media impacts, overall, as compared to the zero discharge option. In particular, the Zero/P2 Alternative has a significantly lower cross-media impact on air emissions of criteria air pollutants than the zero discharge option while still preventing the discharge of 98.5 percent of the pesticide active ingredients (PAIs) from being discharged to the water. The following sections present the estimates for air emissions, solid waste generation and energy consumption for the final rule.

A. Air Pollution

For the purpose of preparing a cross-media impact analysis, the air pollution effects are divided into two separate types of air emissions generated as a result of the final rule. First, there are air emissions estimated for the Zero/P2 Alternative based on the treatment of wastewater through a treatment system, such as the Universal Treatment System, discussed in Section II.E. of today's preamble. These emissions consist mainly of volatile priority pollutants. EPA does not anticipate that there will be any significant losses of PAIs into the atmosphere under the Zero/P2 alternative, because most PAIs have low volatility. The second type of air emissions are those generated from the transport (i.e., air emissions from the trucks' exhaust and gasoline) of both wastewater and spent activated carbon as well as emissions from the incineration of wastewater that is hauled off-site for disposal. Estimates of both types of air emissions are presented on Table 4 of today's preamble for the Zero/P2 Alternative and for zero discharge. As seen on Table

[24] Criteria air pollutants include: Volatile organic compounds (VOCs), nitrogen oxides (NOx), sulfur dioxide (SO2), particulate matter (PM) and carbon monoxide (CO). Criteria air pollutants can injure health, harm the environment and cause property damage.

4, the emissions for criteria air pollutants from the transport of wastewaters and spent activated carbon and from the incineration of the non-reusable wastewaters under the zero discharge option would create a significant cross-media impact as compared to the Zero/P2 Alternative.

TABLE 4: CRITERIA AIR POLLUTANT EMISSIONS (LB/YR)

Emission source	VOCs	NO_x	PM	CO	SO_2
Wastewater Transportation:					
Zero/P2 Alternative	14,720	121,200	6,800	175,400	.....
Zero Discharge	87,600	720,000	40,400	1,044,000	.....
Wastewater Incineration:					
Zero/P2 Alternative	5	1,838	10	133	2
Zero Discharge	264	94,600	530	6,880	106
Spent Activated Carbon Transportation:					
Zero/P2 Alternative	1,692	13,920	780	20,200	.....
Zero Discharge†	NA	NA	NA	NA	.....
Wastewater Treatment:‡					
Zero/P2 Alternative	84,700	NA	NA	NA	NA
Zero Discharge	52,500	NA	NA	NA	NA

NA=not applicable

a: EPA estimates that under the Zero/P2 Alternative 69% of facilities incurring costs will choose the P2 Alternative and 31% will choose to comply with zero discharge.

†There is no wastewater treatment system used under the zero discharge option and, therefore, no spent activated carbon to transport for re-generation.

‡Air emissions estimates from wastewater treatment include only volatile priority pollutants.

EPA also estimates the reduction of volatile priority pollutants emissions that would occur under the Zero/P2 Alternative and under zero discharge. EPA estimates that in addition to the 192,789 lbs of PAIs that are currently (i.e., prior to today's regulation) being discharged to water, 381,000 pounds of volatile priority pollutant are currently emitted when wastewater is discharged to POTWs or are emitted to the air from the wastewater treatment process at the POTWs. EPA estimates that under the Zero/P2 Alternative, the air emissions from wastewater reuse, treatment and discharge to POTWs will be reduced to 84,700 pounds of volatile priority pollutants. This means that implementing the Zero/P2 Alternative will reduce air emissions of volatile priority pollutants from wastewater reuse, treatment and discharge by 296,300 pounds annually. In addition, the remaining emissions are localized and in many cases may be more likely to be captured and treated by the UTS. The loss of priority pollutants to the atmosphere is likely to occur during reuse of wastewater and particularly from the emulsion breaking, hydrolysis, and/or chemical oxidation treatment steps where the addition of heat is likely to promote their release [25]. It is also possible that some emissions of priority pollutants could occur during the cleaning of equipment or containers, particularly if high-pressure cleaning or steam cleaning is used. Under the zero discharge option, 52,500 pounds of volatile priority pollutants are expected to be emitted during the recycle and reuse of wastewaters.

B. Solid Waste

EPA estimates that under the Zero/P2 Alternative there will be 856,000 pounds of sludge generated from emulsion breaking and sulfide precipitation treatment annually. EPA has assumed that the sludge generated via emulsion breaking and sulfide precipitation will be hauled to hazardous waste incinerators. In addition to the sludge generated, treatment of wastewater through the Universal Treatment System will generate 3,830,000 pounds annually of spent activated carbon. It is assumed that the activated carbon will be sent off-site for regeneration, which means that it is reused and would *not* become a waste. See Section XI.A. for the estimate of air emissions from transporting the spent activated carbon for regeneration and from the hauling of wastewater/sludge to incineration as well as the air emissions associated with incineration.

EPA believes the Zero/P2 Alternative is consistent with the goals established for EPA's Hazardous Waste Minimization and Combustion Strategy (November, 1994). This draft combustion strategy establishes the goal of a strong preference for source reduction over waste management, thereby reducing the long-term demand for combustion and other waste management facilities. In addition, the strategy states that combustion does have an appropriate role and that EPA wants to ensure that combustion facilities (such as incinerators and boilers and industrial furnaces (BIFs)) are designed in a manner to protect public health.

C. Energy Requirements

EPA estimates that compliance with the final regulation will increase energy consumption by a small increment over present industry use. The main energy requirement is the generation of steam that is used in the wastewater treatment system to accomplish emulsion breaking and hydrolysis. Steam provides the heat energy to assist with the separation of emulsified phases and increases the rate at which active ingredients hydrolyze. It is estimated that about 6.28×10^7 pounds per year of steam would be required by the Universal Treatment System. This would require approximately 13,581 barrels of oil annually. This is, relatively, very small compared to the 18 million barrels per day that the United States currently consumes.

Additionally, EPA estimates that the operation of the Universal Treatment System will consume 811,000 kilowatt hours per year. This is expended by the pumps and agitators used in treatment and associated with the storage of water until it can be reused.

[25] EPA believes that use of closed vessels in the treatment system will additionally control the release of volatile priority pollutants to the air and, therefore; has used the costs associated with closed vessels when estimating costs for the regulation. However, for the analysis of the air pollution emissions estimates for this rule, estimates on volatile priority pollutant emissions from closed vessels were not available. Therefore, the volatile priority pollutant emissions estimate assumes the use of open vessels during treatment which may overestimate the emissions.

XII. Regulatory Implementation

The purpose of this section is to provide assistance and direction to permit writers and control authorities to aid in their implementation of this regulation and its unique compliance alternative. This section also discusses the relationship of upset and bypass provisions, variances and modifications, and analytical methods to the final limitations and standards.

A. Implementation of the Limitations and Standards

1. Pesticide Formulating, Packaging and Repackaging (Subcategory C)

Each PFPR facility subject to this regulation will need to make an initial choice on either a facility-wide basis or on a process basis (i.e., product family/process line/process unit). They will need to choose to either comply with the zero discharge effluent limitation/pretreatment standard *or* choose to agree to conduct the listed pollution prevention practices (or a variation of the listed practices based on self-implemented modifications or those agreed to by the permit/control authority) and also agree to make the practices and the pollution prevention discharge allowance enforceable (see § 455.41 of the final rule for the definition of P2 allowable discharge). However, beyond this initial choice, much of the continued implementation of the Zero/P2 Alternative will differ for direct and indirect dischargers.

Direct Dischargers

For direct dischargers, the Zero/P2 Alternative will be implemented through the NPDES permitting process. For each new or existing direct discharging facility, the facility would need to make the initial choice at the permitting stage or at the time for permit modification or renewal, respectively. Facilities that do not choose the P2 Alternative (or zero discharge) for the facility in its entirety will be required to clearly state in their NPDES permit each product family, process unit or process line and the option selected for each. For those processes for which a direct discharge facility chooses the P2 Alternative over the zero discharge limitation, the permitting authority would include all of the P2 practices and any specified treatment technologies in the facility's NPDES permit. The definition of P2 allowable discharge for direct dischargers requires the appropriate treatment of *all* process wastewater prior to discharge. Therefore, permit writers may want to include in the permit the method chosen by the facility to demonstrate that the treatment system: (1) Is appropriate for the PAIs in their process wastewaters (that are not also being manufactured); and (2) is properly operated and maintained; or the permit writer can set numerical limitations based on BPJ for any additional PAIs, as necessary.

Today's final regulations do not require facilities to submit all of the necessary compliance paperwork to the NPDES permit writer, but instead require the facility choosing the P2 Alternative to keep the paperwork on-site and available for the permitting authority and enforcement officials. However, EPA is requiring the submittal of an initial certification statement at the time of issuance, renewal, or modification of an NPDES permit for direct dischargers. In addition, as suggested by a commenter, EPA is also requiring the submittal of a periodic certification statement to be submitted every year to the NPDES permit writer. The pollution prevention practices and treatment technologies included in such a NPDES permit would be enforceable under CWA sections 309 and 505.

For those processes where a new or existing direct discharge PFPR/Manufacturer has chosen to comply with zero discharge, the permit would include: (1) The pesticide manufacturing limitations (40 CFR part 455, subparts A and B) with no additional allowance for the PFPR wastewaters for those PAIs that are also manufactured; and (2) limitations set equal to the detection limit of the PAIs expected to be in the wastewater (or no PFPR process wastewater flow) for PAIs that are not also manufactured at the facility. The NPDES permits for new or existing stand-alone direct discharging facilities that choose to achieve zero discharge from specified processes will include either limitations set equal to the detection limit of the analytical method for the PAIs expected to be in the wastewater or will allow no process wastewater flow.

Indirect Dischargers

Existing and new PFPR facilities (including PFPR/Manufacturers) which are indirect dischargers would also need to make an initial choice on a process basis of meeting the zero discharge pretreatment standard or adopting and implementing the P2 practices and the treatment technologies (if so specified). Facilities that choose the zero discharge option for specified processes (or for the entire facility) would agree in their control mechanism or pretreatment agreement to demonstrate zero discharge through no process wastewater flow or compliance by meeting a numerical standard be set equal to the detection limit of the analytical method for the PAIs expected in the wastewater.

If the indirect discharging PFPR facility chooses the P2 Alternative for any or all processes/lines/product families, the facility would need to notify the Control Authority of its intention by submitting an initial certification statement as described in § 455.41(a) of the final regulation. Facilities that do not choose the P2 Alternative for the facility in its entirety will be required to include a brief description of each product family, process unit or process line and the option selected for each with the initial certification statement. In addition, the facility must include all of the P2 practices (or modifications) and any specified treatment technologies that will be implemented to meet the requirements of the practices listed in Table 8 to part 455 for those processes which the P2 Alternative was chosen. For indirect dischargers appropriate pretreatment is required for any interior equipment cleaning wastewater (including drums), floor wash [26] or leak/spill cleanup water that is part of the P2 allowable discharge. Other wastewater sources can be discharged to the POTW without pretreatment. The initial certification statement to be submitted requires a signature by the appropriate manager in charge of overall operations of the facility to assure that information provided is true, accurate, and complete to the best of his or her knowledge.

Other required paperwork can be kept on-site (e.g., supporting documentation for any modifications, treatment technologies used that are not listed on Table 10 to part 455 of the regulation, the method chosen and supporting documentation for demonstrating that appropriate treatment is well operated and maintained and the rationale for choosing the method of demonstration). Any modifications for a reason *not* listed on Table 8 to part 455 of the regulation must be submitted to the control authority for approval.

Once an individual control mechanism (or pretreatment agreement) is in place, facilities need to submit a

[26] In individual cases the requirement of wastewater pretreatment prior to discharge to the POTW may be removed by the control authority for floor wash or the final rinse of a non-reusable triple rinse when the facility has demonstrated that the levels of PAIs and priority pollutants in such wastewaters are at a level that is too low to be effectively pretreated at the facility and have been shown to neither pass through or interfere with the operations of the POTW. The control authority should also take into account whether or not the facility has employed water conservation when generating such a non-reusable wastewater.

periodic certification statement to the control authority indicating that the P2 Alternative is being implemented as in the previous period or that a modification to the individual control mechanism is needed. The certification statement is to be submitted to the control authority on the same time table, i.e., twice per year (June and December), as the reporting required by 40 CFR 403.12(e). The control authority, as part of its approved pretreatment program, must have the authority to ensure compliance with a pretreatment standard (40 CFR 403.8(f)(1)(ii)) and to carry out inspections of the indirect dischargers' self-certifications and of the paperwork described below. 40 CFR 403.8(f)(1)(v).

Necessary Paperwork for the P2 Alternative

As briefly mentioned above, both direct and indirect discharging facilities are required to keep certain paperwork on-site and available for permitting/ control authorities and enforcement officials.

Note: Although EPA is not requiring submittal of all the paperwork for approval in these national regulations, NPDES programs and control authorities may choose to require submittal of any of the paperwork for approval.

The paperwork which is required to be submitted includes the one-time initial certification statement (see § 455.41(a) of the final rule) and the periodic certification statements (see § 455.41(b) of the final rule). The paperwork which can be kept on-site is referred to in this final rule as the ''On-site Compliance Paperwork'' (see § 455.41(c)). Each of these is described below.

For each PFPR facility, the initial certification statement would include, at a minimum, a listing of and descriptions of the processes (i.e., product families/ process lines/process units) for which it chooses the P2 Alternative and those for which it chooses to achieve zero discharge; descriptions of the P2 practices (from Table 8 to part 455 of the regulation) that are being employed and how they are being implemented; description of any justifications allowing modification to the practices listed on Table 8 to part 455; and a description of the treatment system being used to obtain a P2 allowable discharge (as defined in § 455.41). The initial certification statement must be signed by the responsible corporate officer as defined in 40 CFR 403.12(l) or 40 CFR 122.22.

The periodic certification statement is to be submitted twice per year for indirect discharging facilities and once per year for direct discharging facilities and should indicate whether the P2 Alternative is being implemented as set forth in the NPDES permit/control mechanism or that a justification allowing modification of the listed practices has been implemented resulting in a change in the P2 practices conducted at the facility. If the modification needed is not listed on Table 8 of part 455, the facility should request a modification from their permitting/control authority if it has not already done so.

The on-site compliance paperwork should include the information from the initial and periodic certifications but must also include: (1) The supporting documentation for any modifications that have been made to the listed P2 practices (including records that indicate/demonstrate, for example, microbial growth, specific directions for other disposal from the manufacturer, use of a solvent recovery system, etc.); (2) a written discussion demonstrating that the treatment system being used contains the appropriate treatment technologies (i.e., listed by PAI in the Table 10 to Part 455 of the final regulation, equivalent system as defined in § 455.10(h), or pesticide manufacturing system) for removing PAIs that are used in production at their facility and could be in their wastewater; (3) a method for demonstrating that the treatment system is well operated and maintained; and (4) a discussion of the rationale for choosing the method of demonstration. For example, a facility may utilize a surrogate method for determining breakthrough of their carbon adsorption unit. This method could be used instead of performing analytical testing for all or any of the PAIs that may have been in production at the facility over a specific period of time. The facility could possibly use records of carbon change out/purchase to demonstrate that the system is properly operated and maintained and could describe the initial testing and/or vendor information used to determine the useful life of the activated carbon.

Control authorities, at or any time after entering into an individual control mechanism, or permitting authorities, at or any time after issuing, reissuing, or modifying the NPDES permit, could inspect the PFPR facility to see that the listed practices are being employed, that the treatment system is well operated and maintained and that the necessary paperwork provides sufficient justification for any modifications. When facilities need to modify a listed P2 practice for which a justification is not listed in the final regulation, the facility must make a request for the modification from the NPDES permitting authority or the control authority. The permit writer/control authority is expected to use BPJ/BEJ to approve the modification.

Note: EPA is preparing a guidance manual to aid permit writers/control authorities as well as PFPR facilities.

Compliance Dates

EPA has established a three-year deadline for compliance with the PFPR pretreatment standards for existing sources (PSES). Under the zero/P2 alternative facilities will need time to assess which process lines are amenable to the P2 alternative and which lines will have to comply with zero discharge. This decision will most likely be based on economics as well as the characteristics of the individual process line. In addition, facilities will have to determine the treatment necessary for the PAIs expected to be found in the wastewater at their facility and they will need time to design and install these systems. Finally, facilities will need time to prepare the on-site compliance paperwork necessary to support the P2 alternative. Thus, EPA believes that a full three-year compliance period is appropriate.

Existing direct dischargers must comply by the date of issue, reissue or modification of the NPDES permit. New source standards and limitations (PSNS and NSPS) must be complied with when a facility commences the discharging of wastewater.

Note: For this rule, a direct discharge facility is considered a new source if its construction commenced following promulgation of the final rule (40 CFR 122.2); while an indirect discharge facility is considered a new source if construction commenced after proposal (April 1994) of the pretreatment standards (40 CFR 403.3).

Direct dischargers may be subject to the establishment, by the permitting authority, of more stringent effluent limitations based on applicable water quality standards. *See* 40 CFR 122.44. In addition, those PFPR facilities that are indirect dischargers remain subject to the Pass-Through and Interference prohibitions contained in the general pretreatment regulations. 40 CFR 403.5(a)(1). Indirect dischargers could also be subject to local limits established by the control authority receiving the facility's wastewater. 40 CFR 403.5(c).

The Agency emphasizes that although the Clean Water Act is a strict liability statute, EPA can initiate enforcement proceedings at its discretion. EPA has exercised and intends to exercise that

discretion in a manner that recognizes and promotes good faith compliance.

2. Refilling Establishments (Subcategory E)

The limitations and standards for existing and new refilling establishments are set as zero discharge. In addition, many states (with national regulations soon to follow) require these facilities to have secondary containment systems and loading pads for their bulk pesticide and pesticide dispensing operations. Under these state and eventual national secondary containment regulations under FIFRA, facilities are collecting process wastewaters that were formerly contaminating soil and groundwater.

Since the majority of these facilities are not located in an area where direct or indirect discharge is feasible, EPA believes that the zero discharge can be implemented as seen on site visits. Typically, these facilities collect their process wastewaters (including interior equipment cleaning of minibulks, bulk tanks and related ancillary equipment and leak/spill cleanup water) and store these collected rinsates for reuse. The stored rinsates are then used as product make-up water in future custom application activities. Facilities that do not operate their own custom application services or that are located in states where the purchase of make-up water for reuse in applications is prohibited have been known to give away these rinsates to custom applicators or directly to farmers. A small number of facilities in such a situation may choose some means of off-site disposal, such as contract hauling to incineration.

B. Upset and Bypass Provisions

A recurring issue is whether industry limitations and standards should include provisions authorizing noncompliance with effluent limitations during periods of ''upset'' or ''bypass''. An upset, sometimes called an ''excursion,'' is an unintentional and temporary noncompliance with technology-based effluent limitations occurring for reasons beyond the reasonable control of the permittee. EPA believes that upset provisions are necessary to recognize an affirmative defense for an exceptional incident including ''Acts of God''. Because technology-based limitations can require only what properly designed, maintained and operated technology can achieve, it is claimed that liability for such situations is improper.

While an upset is an unintentional episode during which effluent limitations are exceeded, a bypass is an act of intentional noncompliance during which wastewater treatment facilities are circumvented in emergency situations.

EPA has both upset and bypass provisions in NPDES permits, and has promulgated NPDES and pretreatment regulations which include upset and bypass permit provisions. (40 CFR 122.41(m), 122.41(n) and 40 CFR 403.16 and 403.17.) The upset provision establishes an upset as an affirmative defense to prosecution for violation of technology-based effluent limitations. The bypass provision authorizes bypassing to prevent loss of life, personal injury, or severe property damage. Since there are already upset and bypass provisions in NPDES permits and pretreatment regulations, EPA will let local permit and control authorities deal with individual upsets or requests for bypass.

C. Variances and Modifications

Upon the promulgation of these regulations, the effluent limitations for the appropriate subcategory must be applied in all Federal and State NPDES permits issued to direct dischargers in the pesticide formulating, packaging or repackaging industry. In addition, the pretreatment standards are directly applicable to indirect dischargers.

1. Fundamentally Different Factors Variances

For the BPT effluent limitations, the only exception to the binding limitations is EPA's ''fundamentally different factors'' (''FDF'') variance (40 CFR part 125, subpart D). This variance recognizes factors concerning a particular discharger which are fundamentally different from the factors considered in this rulemaking. Although this variance clause was set forth in EPA's 1973–1976 effluent guidelines, it is now included in the NPDES regulations and not the specific industry regulations. (See 44 FR 32854, 32893 [June 7, 1979] for an explanation of the ''fundamentally different factors'' variance). The procedures for application for a BPT FDF variance are set forth at 40 CFR 122.21(m)(1)(I)(A).

Dischargers subject to the BAT limitations in these final regulations may also apply for an FDF variance, under the provisions of section 301(n) of the Act, which regulates BAT, BCT, and pretreatment FDFs. In addition, BAT limitations for nonconventional pollutants may be modified under section 301(c) (for economic reasons) and 301(g) (for water quality reasons) of the Act. These latter two statutory modifications are not applicable to ''toxic'' or conventional pollutants.

Dischargers subject to pretreatment standards for existing sources (PSES) are also subject to the ''fundamentally different factors'' variance provision (40 CFR 403.13) and credits for pollutants removed by POTWs, as discussed in Section XII.C.2. Dischargers subject to pretreatment standards for new sources (PSNS) are subject only to the removal credit provision (*see* Section XII.C.2).

New sources subject to NSPS are not eligible for EPA's ''fundamentally different factors'' variance or any statutory or regulatory variances. *See E.I. Du Pont* v. *Train*, 430 U.S. 112 (1977).

2. Removal Credits

Congress, in enacting Section 307(b) of the CWA, recognized that, in certain instances, POTWs could provide some or all of the treatment of an industrial user's wastestream that would be required pursuant to the pretreatment standard. Consequently, Congress established a discretionary program for POTWs to grant ''removal credits'' to their indirect dischargers. The credit, in the form of a less stringent pretreatment standard, allows an increased amount of pollutants to flow from the indirect discharger's facility to the POTW.

Section 307(b) of the CWA establishes a three-part test for obtaining removal credit authority for a given pollutant. Removal credits may be authorized only if (1) the POTW ''removes [27] all or any part of such toxic pollutant,'' (2) the POTW's ultimate discharge would ''not violate that effluent limitation, or standard which would be applicable to that toxic pollutant if it were discharged'' directly rather than through a POTW and (3) the POTW's discharge would ''not prevent sludge use and disposal by such [POTW] in accordance with section [405] . . . .'' Section 307(b).

EPA has promulgated removal credit regulations in 40 CFR 403.7. The United States Court of Appeals for the Third Circuit has interpreted the statute to require EPA to promulgate comprehensive sewage sludge regulations before any removal credits could be authorized. *NRDC* v. *EPA*, 790 F.2d 289, 292 (3rd Cir. 1986) *cert. denied*. 479 U.S. 1084 (1987). Congress made this explicit in the Water Quality Act of 1987 which provided that EPA

[27] In 40 CFR 403.7, removal is defined to mean ''a reduction in the amount of a pollutant in the POTW's effluent or alteration of the nature of a pollutant during treatment at the POTW. The reduction or alteration can be obtained by physical, chemical or biological means and may be the result of specifically designed POTW capabilities or may be incidental to the operation of the treatment system. Removal as used (in § 403.7) shall not mean dilution of a pollutant in the POTW.''

could not authorize any removal credits until it issued the sewage sludge use and disposal regulations required by section 405(d)(2)(a)(ii).

Section 405 of the CWA requires EPA to promulgate regulations which establish standards for sewage sludge when used or disposed for various purposes. These standards must include sewage sludge management standards as well as numerical limits for pollutants which may be present in sewage sludge in concentrations which may adversely affect public health and the environment. Section 405 requires EPA to develop these standards in two phases. On November 25, 1992, EPA promulgated the Round One sewage sludge regulations establishing standards, including numerical pollutant limits, for the use and disposal of sewage sludge. 58 FR 9248. EPA established pollutant limits for ten metals when sewage sludge is applied to land, for three metals when it is disposed of at surface disposal sites and for seven metals and total hydrocarbons, a surrogate for organic pollutant emissions, when sewage sludge is incinerated. These requirements are codified at 40 CFR part 503.

At the same time EPA promulgated the Round One regulations, EPA also amended its pretreatment regulations to provide that removal credits would be available for certain pollutants regulated in the sewage sludge regulations. *See* 58 FR at 9386. The amendments to Part 403 provide that removal credits may be made potentially available for the following pollutants:

(1) If a POTW applies its sewage sludge to the land for beneficial uses, disposes of it on surface disposal sites or incinerates it, removal credits may be available, depending on which use or disposal method is selected (so long as the POTW complies with the requirements in part 503). When sewage sludge is applied to land, removal credits may be available for ten metals. When sewage sludge is disposed of on a surface disposal site, removal credits may be available for three metals. When the sewage sludge is incinerated, removal credits may be available for seven metals and for 57 organic pollutants. *See* 40 CFR 403.7(a)(3)(iv)(A).

(2) In addition, when sewage sludge is used on land or disposed of on a surface disposal site or incinerated, removal credits may also be available for additional pollutants so long as the concentration of the pollutant in sludge does not exceed a concentration level established in part 403. When sewage sludge is applied to land, removal credits may be available for two additional metals and 14 organic pollutants. When the sewage sludge is disposed of on a surface disposal site, removal credits may be available for seven additional metals and 13 organic pollutants. When the sewage sludge is incinerated, removal credits may be available for three other metals. *See* 40 CFR 403.7(a)(3)(iv)(B).

(3) When a POTW disposes of its sewage sludge in a municipal solid waste land fill that meets the criteria of 40 CFR part 258 (MSWLF), removal credits may be available for any pollutant in sewage sludge. *See* 40 CFR 403.7(a)(3)(iv)(C).

Thus, given compliance with the requirements of EPA's removal credit regulations,[28] following promulgation of the pretreatment standards being proposed here, removal credits may be authorized for any pollutant subject to pretreatment standards if the applying POTW disposes of its sewage sludge in a MSWLF that meets the requirements of 40 CFR part 258. If the POTW uses or disposes of its sewage sludge by land application, surface disposal or incineration, removal credits may be available for the following metal pollutants (depending on the method of use or disposal): Arsenic, cadmium, chromium, copper, lead, mercury, molybdenum, nickel, selenium and zinc. Given compliance with § 403.7, removal credits may be available for the following organic pollutants (depending on the method of use or disposal): acrylonitrile, aldrin/dieldrin (total), benzene, benzidine, benzo(a)pyrene, bis(2-chloroethyl)ether, bis(2-ethylhexyl)phthalate, bromodichloromethane, bromoethane, bromoform, carbon tetrachloride, chlordane, chloroform, chloromethane, DDD, DDE, DDT, dibromochloromethane, dibutyl phthalate, 1,2-dichloroethane, 1,1-dichloroethylene, 2,4-dichlorophenol, 1,3-dichloropropene, diethyl phthalate, 2,4-dinitrophenol, 1,2-diphenylhydrazine, di-n-butyl phthalate, endosulfan, endrin, ehtylbenzene, heptachlor, heptachlor epoxide, hexachlorobutadiene, alphahexachlorocyclohexane, betahexachlorocyclohexane, hexachlorocyclopentadiene, hexachloroethane, hydrogen cyanide, isophorone, lindane, methylene chloride, nitrobenzene, n-nitrosodimethylamine, n-nitrosodi-n-propylamine, pentachlorophenol, phenol, polychlorinated biphenyls, 2,3,7,8-tetrachlorodibenzo-p-dioxin, 1,1,2,2-tetrachloroethane, tetrachloroethylene, toluene, toxaphene, trichloroethylene, 1,2,4-trichlorobenzene, 1,1,1-trichloroethane, 1,1,2-trichloroethane and 2,4,6-trichlorophenol.

With regard to the use of removal credit authority for any pollutant subject to these pretreatment standards, a POTW (once compliance with 40 CFR 403.7 is shown and removal credit authority is granted) may be able to effectively authorize the waiving of what otherwise would be required treatment of the PFPR wastewaters by authorizing a removal credit to the PFPR industrial user to the extent of any pollutants remaining in its discharge after all applicable pollution prevention practices have been complied with. However, removal credits could only be granted to the extent that granting of such credits would not result in pass through or interference at the POTW as defined in 40 CFR 403.3 and in accordance with the provisions of § 403.5, and EPA would expect that the PFPR industrial user would have to continue to comply with the pollution prevention practices as specified in the P2 Alternative even if a removal credit had been provided.

D. Analytical Methods

Section 304(h) of the Act directs EPA to promulgate guidelines establishing test methods for the analysis of pollutants. These methods are used to determine the presence and concentration of pollutants in wastewater, and are used for compliance monitoring and for filing applications for the NPDES program under 40 CFR 122.21, 122.41, 122.44 and 123.25, and for the implementation of the pretreatment standards under 40 CFR 403.10 and 403.12. To date, EPA has promulgated methods for conventional pollutants, toxic pollutants, and for some non-conventional pollutants. The five conventional pollutants are defined at 40 CFR 401.16. Table I–B at 40 CFR part 136 lists the analytical methods approved for these pollutants. The 65 toxic metals and organic pollutants and classes of pollutants are defined at 40 CFR 401.15. From the list of 65 classes of toxic pollutants EPA identified a list of 126 ''Priority Pollutants.'' This list of Priority Pollutants is shown, for example, at 40 CFR part 423, appendix A. The list includes non-pesticide organic pollutants, metal pollutants, cyanide, asbestos, and pesticide

[28] Under § 403.7, a POTW is authorized to give removal credits only under certain conditions. These include applying for, and obtaining, approval from the Regional Administrator (or Director of a State NPDES program with an approved pretreatment program), a showing of consistent pollutant removal and an approved pretreatment program. *See* 40 CFR 403.7(a)(3)(I), (ii), and (iii).

pollutants. Currently approved methods for metals and cyanide are included in the table of approved inorganic test procedures at 40 CFR 136.3, Table I–B. Table I–C at 40 CFR 136.3 lists approved methods for measurement of non-pesticide organic pollutants, and Table I–D lists approved methods for the toxic pesticide pollutants and for other pesticide pollutants.

EPA believes that the analytical methods for pesticide active ingredients contained in the promulgated pesticide manufacturing effluent guidelines and standards (see *Methods for the Determination of Nonconventional Pesticides in Municipal and Industrial Wastewater*, Volumes I & II, EPA 821–R–93–010–A&B, August 1993, Revision 1) will perform equally well on treated pesticide formulating, packaging or repackaging wastewaters as on pesticide manufacturing wastewaters. Raw wastewater samples may on occasion require some separation prior to analysis, analogous to the emulsion breaking pretreatment included in EPA's costed BAT technology. Many of these methods have in fact been used on the PFPR sampled wastewaters. All of the active ingredient pollutant data that supports the proposed effluent limitations were generated using analytical methods that employ the approved methods or are based upon the approved methods at 40 CFR part 136 or contained in *Methods for the Determination of Nonconventional Pesticides in Municipal and Industrial Wastewater*. For PAI's that have no EPA-approved analytical methods, PFPR facilities may utilize alternative sampling and analysis methods as specified in 40 CFR 136.4 and 403.12(g)(4). At some future date, EPA may transfer the analytical methods promulgated at part 455 to part 136 as a part of EPA's effort to consolidate analytical methods and streamline promulgation of new methods. As discussed in Section XII.A.1, EPA believes that those facilities choosing zero discharge will either demonstrate zero discharge through no process wastewater flow or will demonstrate compliance using the analytical methods to show PAIs levels are at or below detection (or meeting pesticide manufacturing limitations with no allowance given to PFPR wastewater). Facilities choosing to demonstrate that they are in compliance with the P2 Alternative will use submittal of certification statements, inspections, and demonstrated implementation of the listed P2 practices to assure compliance with the final rule. However, some facilities, although not required, may use analytical methods to demonstrate that their treatment system are ''well operated and maintained,'' as explained in the P2 Alternative. In addition, permitting/control authorities can set numerical limitations using BPJ/BEJ which may rely on the use of analytical methods for demonstrating compliance.

List of Subjects in 40 CFR Part 455

Environmental protection, Chemicals, Packaging and containers, Pesticides and pests, Pollution prevention, Waste treatment and disposal, Water pollution control.

Dated: September 30, 1996.

Carol M. Browner,

Administrator.

Appendix A to the Preamble—Abbreviations, Acronyms, and Other Terms Used in This Document

B.t.—Bacillus thuringiensis
BAT—Best Available Control Technology Economically Achievable
BCT—Best Conventional Pollutant Control Technology
BEJ—Best Engineering Judgement
BIF—Boilers and Industrial Furnaces
BOD—Biochemical Oxygen Demand
BPJ—Best Professional Judgement
BPT—Best Practicable Control Technology Currently Available
CAA—Clean Air Act
CO—Carbon Monoxide
CSF—Confidential Statement of Formula
CWA—Clean Water Act
DOT—Department of Transportation
FATES—FIFRA and TSCA Enforcement System
FDA—Food and Drug Administration
FDF—Fundamentally Different Factors
FIFRA—Federal Insecticide, Fungicide, Rodenticide Act
GMPs—Good Manufacturing Practices
GRAS—Generally Recognized As Safe
ICR—Information Collection Request
NO_x—Nitrogen oxides
NPDES—National Pollutant Discharge Elimination System
NSPS—New Source Performance Standards
P2—Pollution Prevention
PAI—Pesticide Active Ingredient
PFPR—Pesticide Formulating, Packaging and Repackaging
PM—Particulate Matter
POTW—Publicly Owned Treatment Works
PPA—Pollution Prevention Act
PSES—Pretreatment Standards for Existing Sources
PSNS—Pretreatment Standards for New Sources
RCRA—Resource Conservation and Recovery Act
R & D—Research and Development
SBREFA—Small Business Regulatory Enforcement Fairness Act
SO_2—Sulfur dioxide
SRRP—Source Reduction Review Project
TDD—Technical Development Document
TSCA—Toxic Substances Control Act
TSD—Treatment, Storage and Disposal
TSS—Total Suspended Solids
UMRA—Unfunded Mandate Reform Act
UTS—Universal Treatment System
VOCs—Volatile Organic Compounds
Zero/P2 Alternative—Zero Discharge/Pollution Prevention Alternative Option

For the reasons set out in the preamble, title 40, chapter I of the Code of Federal Regulations is amended as follows:

PART 455—PESTICIDE CHEMICALS

1. The authority citation for part 455 continues to read as follows:

Authority: Secs. 301, 304, 306, 307, and 501, Pub. L. 92–500, 86 Stat, 816, Pub. L. 95–217, 91 Stat. 156, and Pub. L. 100–4, 101 Stat. 7 (33 U.S.C. 1311, 1314, 1316, 1317, and 1361).

1a. Section 455.10 is amended by adding paragraphs (g) through (u) to read as follows:

§ 455.10 General definitions.

* * * * *

(g) *Appropriate pollution control technology* means the wastewater treatment technology listed in Table 10 to this part 455 for a particular PAI(s) including an emulsion breaking step prior to the listed technology when emulsions are present in the wastewater to be treated.

(h) *Equivalent system* means a wastewater treatment system that is demonstrated in literature, treatability tests or self-monitoring data to remove a similar level of pesticide active ingredient (PAI) or priority pollutants as the applicable appropriate pollution control technology listed in Table 10 to this Part 455.

(i) *Formulation* of pesticide products means the process of mixing, blending or diluting one or more pesticide active ingredients (PAIs) with one or more active or inert ingredients, without an intended chemical reaction to obtain a manufacturing use product or an end use product.

(j) *Group 1 mixtures* means any product whose only pesticidal active ingredient(s) is: a common food/food constituent or non-toxic household item; or is a substance that is generally recognized as safe (GRAS) by the Food and Drug Administration (21 CFR 170.30, 182, 184, and 186) in accordance with good manufacturing practices, as defined by 21 CFR part 182; or is exempt from FIFRA under 40 CFR 152.25.

(k) *Group 2 mixtures* means those chemicals listed in Table 9 to this part 455.

(l) *Inorganic wastewater treatment chemicals* means inorganic chemicals that are commonly used in wastewater treatment systems to aid in the removal

of pollutants through physical/chemical technologies such as chemical precipitation, flocculation, neutralization, chemical oxidation, hydrolysis and/or adsorption.

(m) *Interior wastewater sources* means wastewater that is generated from cleaning or rinsing the interior of pesticide formulating, packaging or repackaging equipment; or from rinsing the interior of raw material drums, shipping containers or bulk storage tanks; or cooling water that comes in direct contact with pesticide active ingredients (PAIs) during the formulating, packaging or repackaging process.

(n) *Microorganisms* means registered pesticide active ingredients that are biological control agents listed in 40 CFR 152.20(a)(3) including Eucaryotes (protozoa, algae, fungi), Procaryotes (bacteria), and Viruses.

(o) *Packaging* of pesticide products means enclosing or placing a formulated pesticide product into a marketable container.

(p) *PFPR/Manufacturer* means a pesticide formulating, packaging and repackaging facility that also performs pesticide manufacturing on-site and commingles their PFPR process wastewaters and pesticide manufacturing process wastewaters.

(q) *Pool chemicals* means pesticide products that are intended to disinfect or sanitize, reducing or mitigating growth or development of microbiological organisms including bacteria, algae, fungi or viruses in the water of swimming pools, hot tubs, spas or other such areas, in the household and/or institutional environment, as provided in the directions for use on the product label.

(r) *Refilling establishment* means an establishment where the activity of repackaging pesticide product into refillable containers occurs.

(s) *Repackaging* of pesticide products means the transfer of a pesticide formulation (or PAI) from one container to another without a change in composition of the formulation or the labeling content, for sale or distribution.

(t) *Sanitizer products* means pesticide products that are intended to disinfect or sanitize, reducing or mitigating growth or development of microbiological organisms including bacteria, fungi or viruses on inanimate surfaces in the household, institutional, and/or commercial environment and whose labeled directions for use result in the product being discharged to Publicly Owned Treatment Works (POTWs). This definition shall also include sanitizer solutions as defined by 21 CFR 178.1010 and pool chemicals as defined in this section (455.10(q)). This definition does not include liquid chemical sterilants (including sporicidals) exempted by § 455.40(f) or otherwise, industrial preservatives, and water treatment microbiocides other than pool chemicals.

(u) *Stand-alone PFPR facility* means a PFPR facility where either: No pesticide manufacturing occurs; or where pesticide manufacturing process wastewaters are not commingled with PFPR process wastewaters. Such facilities may formulate, package or repackage or manufacture other non-pesticide chemical products and be considered a ''stand-alone'' PFPR facility.

1b. Section 455.11 is revised to read as follows:

§ 455.11 Compliance date for pretreatment standards for existing sources (PSES).

All discharges subject to pretreatment standards for existing sources (PSES) in subparts A and B of this part must comply with the standards no later than September 28, 1993.

Subpart C—Pesticide Formulating, Packaging and Repackaging (PFPR) Subcategory

2. Section 455.40 is revised as to read as follows:

§ 455.40 Applicability; description of the pesticide formulating, packaging and repackaging subcategory.

(a) The provisions of this subpart are applicable to discharges resulting from all pesticide formulating, packaging and repackaging operations except as provided in paragraphs (b), (c), (d), (e) and (f) of this section.

(b) The provisions of this subpart do not apply to repackaging of agricultural pesticides performed at refilling establishments, as described in § 455.60.

(c) The provisions of this subpart do not apply to wastewater discharges from: the operation of employee showers and laundry facilities; the testing of fire protection equipment; the testing and emergency operation of safety showers and eye washes; storm water; Department of Transportation (DOT) aerosol leak test bath water from non-continuous overflow baths (batch baths) where no cans have burst from the time of the last water change-out; and on-site laboratories from cleaning analytical equipment and glassware and rinsing the retain sample container (except for the initial rinse of the retain sample container which is considered a process wastewater source for this subpart).

(d) The provisions of this subpart do not apply to wastewater discharges from the formulation, packaging and/or repackaging of sanitizer products (including pool chemicals); microorganisms; inorganic wastewater treatment chemicals; group 1 mixtures and group 2 mixtures, as defined under § 455.10.

(e) The provisions of this subpart do not apply to wastewater discharges from the development of new formulations of pesticide products and the associated efficacy and field testing at on-site or stand-alone research and development laboratories where the resulting pesticide product is not produced for sale.

(f) The provisions of this subpart do not apply to wastewater discharges from the formulation, packaging and/or repackaging of liquid chemical sterilant products (including any sterilant or subordinate disinfectant claims on such products) for use on a critical or semi-critical device, as defined in Section 201 of the Federal Food, Drug and Cosmetic Act and in Section 2(u) of the Federal Insecticide, Fungicide and Rodenticide Act.

3. Section 455.41 is added to Subpart C to read as follows:

§ 455.41 Special definitions.

(a) *Initial Certification Statement* for this subpart means a written submission to the appropriate permitting authority, *e.g.*, the local Control Authority (the POTW) or NPDES permit writer which must be signed by the responsible corporate officer as defined in 40 CFR 403.12(l) or 40 CFR 122.22 and which:

(1) Lists and describes those product families, process lines and/or process units for which the PFPR facility is implementing the Pollution Prevention Alternative (''P2 Alternative'');

(2) Describes the PFPR facility specific practices for each product family/process line/process unit which are to be practiced as part of the P2 Alternative;

(3) Describes any justification allowing modification to the practices listed in Table 8 to this part 455; and

(4) Lists the treatment system being used to obtain a P2 allowable discharge (as defined in 455.41).

(b) *Periodic Certification Statement* for this subpart means a written submission to the appropriate permitting authority, *e.g.*, the local Control Authority (the POTW) or NPDES permit writer, which states that the P2 Alternative is being implemented in the manner set forth in the control mechanism (for indirect dischargers) or NPDES permit (for direct dischargers) or that a justification allowing modification of the practices listed in Table 8 to this part 455 has been

implemented resulting in a change in the pollution prevention practices conducted at the facility. The Periodic Certification Statement must be signed by the responsible corporate officer as defined in 40 CFR 403.12(l) or 40 CFR 122.22.

(c) *On-site Compliance Paperwork* for this subpart means data or information maintained in the offices of the PFPR facility which supports the initial and periodic certification statements as follows:

(1) Lists and describes those product families, process lines and/or process units for which the facility is implementing the P2 Alternative;

(2) Describes the facility specific practices for each product family/process line/process unit which are to be practiced as part of the P2 Alternative;

(3) Describes any justification allowing modification to the practices listed in Table 8 to this part 455;

(4) Includes a written discussion demonstrating that the treatment system being used contains the appropriate pollution control technologies (or equivalent systems/pesticide manufacturing systems) for removing the PAIs which may be found in the wastewater;

(5) Establishes a method for demonstrating to the permitting/control authority that the treatment system is well operated and maintained; and

(6) Includes a discussion of the rationale for choosing the method of demonstration.

(d) For Indirect Dischargers:

Pollution prevention (P2) allowable discharge (excluding interior wastewater sources, leak and spill clean-up water, and floor wash) for this subpart means the quantity of/concentrations of pollutants in PFPR process wastewaters that remain after a facility has demonstrated that it is using the specified practices of the Pollution Prevention Alternative as listed in Table 8 to this part 455.

Pollution prevention (P2) allowable discharge for interior wastewater sources, leak and spill cleanup water, and floor wash for this subpart means the quantity of/concentrations of pollutants in PFPR process wastewaters that remain after a facility has demonstrated that it is using the specified practices of the Pollution Prevention Alternative as listed in Table 8 to this part 455 and that have been pretreated using appropriate pollution control technologies, as defined in § 455.10(g), or a pesticide manufacturer's treatment system, or an equivalent system, used individually, or in any combination to achieve a sufficient level of pollutant reduction. Pretreatment requirements may be modified or waived by the Control Authority (POTW) to the extent that removal credits have been granted by the POTW in accordance with 40 CFR 403.7, provided the granting of such credits does not result in pass through or interference as defined in 40 CFR 403.3 and complies with the provisions of 40 CFR 403.5. The facility must demonstrate that the appropriate pollution control technology is properly maintained and operated.

(e) For Direct Dischargers:

Pollution prevention (P2) allowable discharge for this subpart means the quantity of/concentrations of pollutants in PFPR process wastewaters that remain after a facility has demonstrated that it is using the specified practices of the Pollution Prevention Alternative as listed in Table 8 to this part 455 and that have been treated using appropriate pollution control technologies, as defined in § 455.10(g), or a pesticide manufacturer's treatment system, or an equivalent system, used individually, or in any combination to achieve a sufficient level of pollutant reduction. The facility must demonstrate that the appropriate pollution control technology is properly maintained and operated.

(f) *Process wastewater,* for this subpart, means all wastewater associated with pesticide formulating, packaging and repackaging except for sanitary water, non-contact cooling water and those wastewaters excluded from the applicability of the rule in § 455.40.

4. Section 455.42 is revised to read as follows:

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

Except as provided in 40 CFR 125.30 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) Except as provided in paragraph (b) of this section, the following limitations establish the quantity or quality of pollutants or pollutant properties controlled by this paragraph which may be discharged from the formulation, packaging or repackaging of pesticides: There shall be no discharge of process wastewater pollutants to navigable waters.

Note: For existing PFPR/Manufacturer facilities, as defined in § 455.10(p), which are also subject to the provisions of § 455.22 or § 455.32, ''zero discharge'' means that permitting authorities shall provide no additional discharge allowance for those pesticide active ingredients (PAIs) in the pesticide formulating, packaging and repackaging wastewaters when those PAIs are also manufactured at the same facility.

(b) Any existing facility subject to paragraph (a) of this section may have a pollution prevention allowable discharge, as defined in § 455.41(e), of wastewater pollutants to navigable waters if the discharger agrees to NPDES permit conditions as follows:

(1) The discharger will meet the requirements of the Pollution Prevention Alternative listed in Table 8 to this part 455 (or received a modification by Best Professional Judgement for modifications not listed in Table 8 of this Part 455);

(2) The discharger will notify its NPDES permit writer at the time of renewal or modification of its permit, of its intent to utilize the Pollution Prevention Alternative by submitting to the NPDES permit writer an initial certification statement as described in § 455.41(a);

(3) The discharger will submit to its NPDES permitting authority a periodic certification statements as described in § 455.41(b) once each year of operation; and

(4) The discharger will maintain at the office of the facility and make available for inspection the on-site compliance paperwork as described in § 455.41(c).

5. New §§ 455.43 through 455.47 are added to subpart C to read as follows:

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

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology.

(a) Except as provided in paragraph (b) of this section, the BCT limitations are established as follows: There shall be no discharge of process wastewater pollutants to navigable waters.

Note: For existing PFPR/Manufacturer facilities, as defined in § 455.10(p), which are also subject to the provisions of §§ 455.23, *zero discharge* means that permitting authorities shall provide no discharge additional discharge allowance for those pesticide active ingredients (PAIs) in the pesticide formulating, packaging and repackaging wastewaters when those PAIs are also manufactured at the same facility.

(b) Any existing facility subject to paragraph (a) of this section may have a pollution prevention allowable discharge, as defined in § 455.41(e), of wastewater pollutants to navigable waters if the discharger agrees to NPDES permit conditions as follows:

(1) The discharger will meet the requirements of the Pollution Prevention Alternative listed in Table 8 to this Part 455 (or received a modification by Best Professional Judgement for modifications not listed in Table 8 of this Part 455);

(2) The discharger will notify its NPDES permit writer at the time of renewal or modification of its permit, of its intent to utilize the Pollution Prevention Alternative by submitting to the NPDES permit writer an initial certification statement as described in § 455.41(a);

(3) The discharger will submit to its NPDES permitting authority a periodic certification statement as described in § 455.41(b) once each year of operation; and

(4) The discharger will maintain at the office of the facility and make available for inspection the on-site compliance paperwork as described in § 455.41(c).

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

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology (BAT).

(a) Except as provided in paragraph (b) of this section, the BAT limitations are established as follows: There shall be no discharge of process wastewater pollutants to navigable waters.

Note: For existing PFPR/Manufacturer facilities, as defined in § 455.10(p), which are also subject to the provisions of §§ 455.24, *zero discharge* means that permitting authorities shall provide no additional discharge allowance for those pesticide active ingredients (PAIs) in the pesticide formulating, packaging and repackaging wastewaters when those PAIs are also manufactured at the same facility.

(b) Any existing facility subject to paragraph (a) of this section may have a pollution prevention allowable discharge, as defined in § 455.41(e), of wastewater pollutants to navigable waters if the discharger agrees to NPDES permit conditions as follows:

(1) The discharger will meet the requirements of the Pollution Prevention Alternative listed in Table 8 to this Part 455 (or received a modification by Best Professional Judgement for modifications not listed on Table 8 of this Part 455);

(2) The discharger will notify its NPDES permitting authority at the time of renewal or modification of its permit, of its intent to utilize the Pollution Prevention Alternative by submitting to the NPDES permit writer an initial certification statement as described in § 455.41(a);

(3) The discharger will submit to its NPDES permit writer a periodic certification statement as described in § 455.41(b) once each year of operation; and

(4) The discharger will maintain at the office of the facility and make available for inspection the on-site compliance paperwork as described in § 455.41(c).

§ 455.45 New Source Performance Standards (NSPS).

(a) Any new source, except as provided in paragraph (b) of this section, subject to this subpart which discharges process wastewater must meet the following standards: There shall be no discharge of process wastewater pollutants to navigable waters.

Note: For new PFPR/Manufacturer facilities, as defined in § 455.10(p), which are also subject to the provisions of §§ 455.25, *zero discharge* means that permitting authorities shall provide no additional discharge allowance for those pesticide active ingredients (PAIs) in the pesticide formulating, packaging and repackaging wastewaters when those PAIs are also manufactured at the same facility.

(b) Any new source subject to paragraph (a) of this section may have a pollution prevention allowable discharge, as defined in § 455.41(e), of wastewater pollutants to navigable waters if the discharger agrees to NPDES permit conditions as follows:

(1) The discharger will meet the requirements of the Pollution Prevention Alternative listed in Table 8 to this Part 455 (or received a modification by Best Professional Judgement for modifications not listed in Table 8 of this Part 455);

(2) The discharger will notify its NPDES permit writer at the time of submitting its application for a permit, of its intent to utilize the Pollution Prevention Alternative by submitting to the NPDES permit writer an initial certification statement as described in § 455.41(a);

(3) The discharger will submit to its NPDES permitting authority a periodic certification statement as described in § 455.41(b) once each year of operation; and

(4) The discharger will maintain at the office of the facility and make available for inspection the on-site compliance paperwork as described in § 455.41(c).

§ 455.46 Pretreatment standards for existing sources (PSES).

(a) Except as provided in 40 CFR 403.7 and 403.13 or in paragraph (b) of this section, no later than November 6, 1999, 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 PSES as follows: There shall be no discharge of process wastewater pollutants.

(b) Except as provided in 40 CFR 403.7 and 403.13, any existing source subject to paragraph (a) of this section which introduces pollutants into a publicly owned treatment works must comply with 40 CFR part 403 and may have a pollution prevention allowable discharge of wastewater pollutants, as defined in § 455.41(d), if the discharger agrees to control mechanism or pretreatment agreement conditions as follows:

(1) The discharger will meet the requirements of the Pollution Prevention Alternative listed in Table 8 to this Part 455 (or received a modification by Best Engineering Judgement for modifications not listed in Table 8 to this Part 455);

(2) The discharger will notify its local Control Authority at the time of renewing or modifying its individual control mechanism or pretreatment agreement of its intent to utilize the Pollution Prevention Alternative by submitting to the local Control Authority an initial certification statement as described in § 455.41(a);

(3) The discharger will submit to its local Control Authority a periodic certification statement as described in § 455.41(b) during the months of June and December of each year of operation; and

(4) The discharger will maintain at the offices of the facility and make available for inspection the on-site compliance paperwork as described in § 455.41(c).

(c) Except as provided in 40 CFR 403.7 and 403.13, any existing source subject to § 455.46(b) which introduces pollutants into a publicly owned treatment works must comply with 40 CFR part 403 and may submit a request to its Control Authority to waive pretreatment of: floor wash; and/or a non-reusable final rinse of a triple rinse, if the concentrations of pesticide active ingredients and priority pollutants in those wastewater sources have been demonstrated to be too low to be effectively pretreated at the facility. The Control Authority may waive

pretreatment for these two wastewaters only if the existing source makes the demonstrations and is in compliance with 40 CFR 403.5.

§ 455.47 Pretreatment Standards for New Sources (PSNS).

(a) Except as provided in 40 CFR 403.7 and 403.13 or in paragraph (b) of this section, 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 PSNS as follows: There shall be no discharge of process wastewater pollutants.

(b) Except as provided in 40 CFR 403.7 and 403.13, any new source subject to paragraph (a) of this section which introduces pollutants into a publicly owned treatment works must comply with 40 CFR part 403 and may have a pollution prevention allowable discharge of wastewater pollutants, as defined in § 455.41(d), if the discharger agrees to control mechanism or pretreatment agreement conditions as follows:

(1) The discharger will meet the requirements of the Pollution Prevention Alternative listed in Table 8 to this Part 455 (or received a modification by Best Engineering Judgement for modifications not listed in Table 8 to this Part 455);

(2) The discharger will notify its local Control Authority at the time of submitting its application for an individual control mechanism or pretreatment agreement of its intent to utilize the Pollution Prevention Alternative by submitting to the local Control Authority an initial certification statement as described in § 455.41(a);

(3) The discharger will submit to its local Control Authority a periodic certification statement as described in § 455.41(b) during the months of June and December of each year of operation; and

(4) The discharger will maintain at the offices of the facility and make available for inspection the on-site compliance paperwork as described in § 455.41(c).

(c) Except as provided in 40 CFR 403.7 and 403.13, any new source subject to paragraph (b) of this section which introduces pollutants into a publicly owned treatment works must comply with 40 CFR part 403 and may submit a request to its Control Authority to waive pretreatment of: floor wash; and/or a non-reusable final rinse of a triple rinse, if the concentrations of pesticide active ingredients and priority pollutants in those wastewater sources have been demonstrated to be too low to be effectively pretreated at the facility. The Control Authority may waive pretreatment for these two wastewaters only if the new source makes the demonstrations and is in compliance with 40 CFR 403.5.

6. A new subpart E consisting of §§ 455.60 through 455.67 is added to read as follows:

Subpart E—Repackaging of Agricultural Pesticides Performed at Refilling Establishments

Sec.

Subpart E—Repackaging of Agricultural Pesticides Performed at Refilling Establishments

§ 455.60 Applicability; description of repackaging of agricultural pesticides performed by refilling establishments subcategory.

(a) The provisions of this subpart are applicable to discharges resulting from all repackaging of agricultural pesticides performed by refilling establishments, as defined in § 455.10; whose primary business is wholesale or retail sales; and where no pesticide manufacturing, formulating or packaging occurs, except as provided in paragraphs (b), (c) and (d) of this section.

(b) The provisions of this subpart do not apply to wastewater discharges from custom application or custom blending, as defined in 40 CFR 167.3.

(c) The provisions of this subpart do not apply to wastewater discharges from: the operation of employee showers and laundry facilities; the testing of fire protection equipment; the testing and emergency operation of safety showers and eye washes; or storm water.

(d) The provisions of this subpart do not apply to wastewater discharges from the repackaging of microorganisms or Group 1 Mixtures, as defined under § 455.10, or non-agricultural pesticide products.

§ 455.61 Special definitions.

Process wastewater, for this subpart, means all wastewater except for sanitary water and those wastewaters excluded from the applicability of the rule in § 455.60.

§ 455.62 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best practicable pollutant control technology (BPT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable pollutant control technology: There shall be no discharge of process wastewater pollutants.

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

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollution control technology: There shall be no discharge of process wastewater pollutants.

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

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable: There shall be no discharge of process wastewater pollutants.

§ 455.65 New source performance standards (NSPS).

Any new source subject to this subpart which discharges process wastewater pollutants must meet the following standards: There shall be no discharge of process wastewater pollutants.

§ 455.66 Pretreatment standards for existing sources (PSES).

Except as provided in 40 CFR 403.7 and 403.13, no later than November 6, 1999 subpart which introduces pollutants into a publicly owned treatment works must comply with 40

CFR part 403 and achieve the pretreatment standards for existing sources as follows: There shall be no discharge of process wastewater pollutants.

§ 455.67 Pretreatment standards for new sources (PSNS).

Except as provided in 40 CFR 403.7 and 403.13, 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 pretreatment standards for existing sources as follows: There shall be no discharge of process wastewater pollutants.

7. Tables 8, 9, and 10 are added to part 455 to read as follows:

Table 8 to Part 455—List of Pollution Prevention Alternative Practices

A modification to the list of practices on this table that an individual facility must comply with to be eligible for the pollution prevention alternative is allowed with acceptable justification as listed on this table as approved by the permit writer or control authority (using BPJ/BEJ) after submittal by the facility of a request for modification. A modification, for purposes of this table, means that a facility would no longer have to perform a listed practice or would need to comply with a modified practice. However, the modification only applies to the specific practice for which the modification has been justified and to no other listed practices. Facilities are required to thoroughly discuss all modifications in the on-site compliance paperwork as described above in the limitations and standards (§ 455.41(c)).

1. Must use water conservation practices. These practices may include, but are not limited to using: spray nozzles or flow reduction devices on hoses, low volume/high pressure rinsing equipment, floor scrubbing machines, mop(s) and bucket(s), and counter current staged drum rinsing stations.

[Modification allowed when: Rinsing narrow transfer lines or piping where sufficient rinsing is better achieved by flushing with water.]

2. Must practice good housekeeping:

(a) Perform preventative maintenance on all valves and fittings and repair leaky valves and fittings in a timely manner;

(b) Use drip pans under any valves or fittings where hoses or lines are routinely connected and disconnected, collect for reuse when possible; and

(c) Perform quick cleanup of leaks and spills in outdoor bulk storage or process areas.

3. Must sweep or vacuum dry production areas prior to rinsing with water.

4. Must clean interiors of dry formulation equipment with dry carrier prior to any water rinse. The carrier material must be stored and reused in future formulation of the same or compatible product or properly disposed of as solid waste.

5. If operating continuous overflow Department of Transportation (DOT) aerosol leak test baths—>

Must operate with some recirculation.

6. If operating air pollution control wet scrubbers—>

Must operate as recirculating scrubbers (periodic blowdown is allowed as needed).

[Modification allowed when: Facility demonstrates that they would not be able to meet Resource Conservation Recovery Act or Clean Air Act (CAA) requirements.]

7. When performing rinsing of raw material drums, storage drums, and/or shipping containers that contained liquid PAI(s) and/or inert ingredients for the formulation of water-based products—>

Must reuse the drum/shipping container rinsate DIRECTLY into the formulation at the time of formulation; or store for use in future formulation of same or compatible product; or use a staged drum rinsing station (counter current rinsing).

[Modification allowed when: the drum/shipping container holds inert ingredient(s) only and (1) the facility can demonstrate that, after using water conservation practices, the large concentration of inert ingredient in the formulation creates more volume than could feasibly be reused; or (2) the facility can demonstrate that the concentration of the inert in the formulation is so small that the reuse would cause a formulation to exceed the ranges allowed in the Confidential Statement of Formula (CSF) (40 CFR 158.155).]

8. When performing rinsing of raw material drums, storage drums, and/or shipping containers that contained liquid PAI(s) and/or inert ingredients for the formulation of solvent-based products—>

Must reuse the drum/shipping container rinsate DIRECTLY into the formulation at the time of formulation or store for use in future formulation of same or compatible product.

[Modification allowed when:

(a) The drum/shipping container holds inert ingredient(s) only *and*: (1) The facility can demonstrate that, after using water conservation practices, the large concentration of inert ingredient in the formulation creates more volume than could feasibly be reused; or (2) the facility can demonstrate that the concentration of the inert in the formulation is so small that the reuse would cause a formulation to exceed the ranges allowed in the Confidential Statement of Formula (CSF) (40 CFR 158.155); *or*

(b) Drums/shipping containers are going to a drum refurbisher/recycler who will only accept drums rinsed with water.]

9. Must dedicate PFPR production equipment by water-based versus solvent-based products. Dedicated solvent-based or water-based equipment may be used on a non-routine basis for non-dedicated operations; however the facility may not discharge the solvent/aqueous changeover rinsate as part of their P2 allowable discharge (i.e., the facility must achieve zero discharge of those process wastewater pollutants).

[Modification allowed when: Facility has installed and is using a solvent recovery system for the changeover rinsate (can also be used for other solvent recovery).]

10. Must store the rinsate from interior rinsing (does not include drum/shipping container rinsate) for reuse in future formulation of same or compatible product.

[Modification allowed when:

(a) Facility has evidence of biological growth or other product deterioration over a typical storage period;

(b) Facility has space limitations, BUT must still store rinsates for most frequently produced products;

(c) Manufacturer (or formulator contracting for toll formulating) has directed otherwise (i.e., send back to them or send for off-site disposal);

(d) Facility is dropping registration or production of the formulation and there is no compatible formulation for reuse of the rinsates or facility can provide reasonable explanation of why it does not anticipate formulation of same or compatible formulation within the next 12 months;

(e) Facility only performs packaging of the pesticide product from which interior rinsate is generated; or

(f) Facility has demonstrated that it must use a detergent to clean the equipment.]

Notes

For indirect dischargers: After following the practices above, some wastewaters may require pretreatment prior to discharge to POTWs. See definition of pollution prevention allowable discharge for indirect dischargers (§ 455.41(d)).

For direct dischargers: After following the practices above, all wastewaters require treatment prior to discharge directly to the nation's waters. See definition of pollution prevention allowable discharge for direct dischargers (§ 455.41(e)).

Additional information and guidance on implementing these P2 practices as well as evaluating compliance with these practices will be available in a P2 Guidance Manual for the PFPR Industry.

TABLE 9 TO PART 455.—GROUP 2 MIXTURES

Shaughnessey code	Chemical name[1]
002201	Sabadilla alkaloids.
006501	Aromatic petroleum derivative solvent.
006602	Heavy aromatic naphtha.
016601[2]	Dry ice.
022003	Coal tar.
025001	Coal tar neutral oils.
025003	Creosote oil (Note: Derived from any source).
025004	Coal tar creosote.
031801	Ammonium salts of C8–18 and C18' fatty acids.
055601	BNOA.
063501	Kerosene.
063502	Mineral oil—includes paraffin oil from 063503.
063503	Petroleum distillate, oils, solvent, or hydrocarbons; also p.
063506	Mineral spirits.
067003	Terpineols (unspec.).
067205	Pine tar oil.
067207	Ester gum.
067302	Amines, N-coco alkyltrimethylenedi-, acetates.
069152	Amines, coco alkyl, hydrochlorides.
070801	Red Squill glycoside.
071004	Cube Resins other than rotenone.
071501	Ryania speciosa, powdered stems of.
072602[2]	Silica gel.
072605[2]	Silicon dioxide.
079014	Turkey red oil.
079021	Potassium salts of fatty acids.
079029	Fatty alcohols (52–61% C10, 39–46% C8, 0–3% C6, 0–3% C12).
079034	Methyl esters of fatty acids (100% C8–C12)
079059	Fatty alcohols (54.5% C10, 45.1% C8, 0.4% C6)
086803	Xylene range aromatic solvent
107302	Polyhedral inclusion bodies of Douglas fir tussock moth nucl.
107303	Polyhedral inclusion bodies of gypsy moth nucleopolyhedrosis.
107304	Polyhedral inclusion bodies of n. sertifer
116902	Gibberellin A4 mixt. with Gibberellin A7.
117001	Nosema locustae.
128888	Lactofen (ANSI).
128934[2]	Nitrogen, liquid.
129029	Bergamot Oil.
224600	Diethanolamides of the fatty acids of coconut oil (coded 079).
505200	Isoparaffinic hydrocarbons.

[1] Shaughnessey codes and chemical names are taken directly from the FATES database. Several chemical names are truncated because the chemical names listed in the FATES database are limited to 60 characters.

[2] EPA does not believe this PAI will persist in sanitary streams long enough to reach a POTW.

Table 10 to Part 455—List of Appropriate Pollution Control Technologies

This table contains those pollutant control technologies, such as hydrolysis, chemical oxidation, precipitation and activated carbon adsorption, which have been used for estimating compliance costs on a PAI specific basis. In general, these treatment technologies have been determined to be effective in treating pesticide containing wastewaters in literature, in bench or pilot scale treatability studies or in the Pesticide Manufacturing effluent guidelines. These are the same technologies that are presented as part of the Universal Treatment System. However, these technologies are PAI specific and may need to be used in conjunction with one another to provide treatment for all PAIs used at a facility over a period of time. In addition, facilities may experience difficulties treating wastewaters that contain emulsions, therefore, ''appropriate'' treatment for emulsified wastewaters must include an emulsion breaking step. For PAIs whose technology is listed as ''Pollution Prevention'', the permitting authority/control authority can determine if additional treatment is necessary through best professional judgement/best engineering judgement, respectively.

TABLE 10 TO PART 455.—LIST OF APPROPRIATE POLLUTION CONTROL TECHNOLOGIES[1]

PAI name[2]	PAI code[3]	Shaughnessy code[4]	Structural group[5]	Treatment technology
Dicofol	001	10501	DDT	Hydrolysis.
Maleic Hydrazide	002	51501	Hydrazide	Activated Carbon.
EDB	003	42002	EDB	Activated Carbon.
Vancide TH	004	82901	s-Triazine	Activated Carbon.
1,3-Dichloropropene	005	29001	EDB	Hydrolysis.
Thenarsazine Oxide	006	12601	Organoarsenic	Precipitation.
Dowicil 75	007	17901	NR4	Activated Carbon.
Triadimefon	008	109901	s-Triazine	Activated Carbon.
Hexachlorophene	009	44901	Chlorophene	Activated Carbon.
Tetrachlorophene	010		Chlorophene	Activated Carbon.
Dichlorophene	011	55001	Chlorophene	Activated Carbon.
Dichlorvos	012	84001	Phosphate	Hydrolysis.
Landrin-2	013		Carbamate	Activated Carbon.
2,3,6-T, S&E or Fenac	014	82605	2,4-D	Activated Carbon.
2,4,5-T and 2,4,5-T, S&E	015	(*)	2,4-D	Activated Carbon.
2,4-D (2,4-D, S&E)	016	(*)	2,4-D	Chemical Oxidation.
2,4-DB, S&E	017	(*)	2,4-D	Activated Carbon.
Dyrene or Anilazine	018	80811	s-Triazine	Activated Carbon.
Dinocap	019	36001	Phenylcrotonate	Activated Carbon.
Dichloran or DCNA	020	31301	Aryl Halide	Activated Carbon.
Busan 90	021	8707	Miscellaneous Organic	Activated Carbon.
Mevinphos	022	15801	Phosphate	Hydrolysis.
Sulfallate	023		Dithiocarbamate	Activated Carbon.

TABLE 10 TO PART 455.—LIST OF APPROPRIATE POLLUTION CONTROL TECHNOLOGIES [1]—Continued

PAI name [2]	PAI code [3]	Shaughnessy code [4]	Structural group [5]	Treatment technology
Chlorfenvinphos	024	84101	Phosphate	Activated Carbon.
Cyanazine or Bladex	025	100101	s-Triazine	Activated Carbon.
Propachlor	026	19101	Acetanilide	Activated Carbon.
MCPA, S&E	027	(*)	2,4-D	Activated Carbon.
Octhilinone	028	99901	Heterocyclic	Activated Carbon.
Pindone	029	67703	Miscellaneous Organic	Activated Carbon.
Dichlorprop, S&E	030	(*)	2,4-D	Activated Carbon.
MCPP, S&E or Mecoprop	031	(*)	2,4-D	Activated Carbon.
Thiabendazole	032	60101	Heterocyclic	Activated Carbon.
Belclene 310	033	80815	s-Triazine	Activated Carbon.
Chlorprop, S&E	034	21202	2,4-D	Activated Carbon.
Busan 72 or TCMTB	035	35603	Heterocyclic	Hydrolysis.
Chlorophacinone	037	67707	Miscellaneous Organic	Activated Carbon.
Landrin-1	038	.....	Carbamate	Activated Carbon.
Pronamide	039	101701	Chlorobenzamide	Activated Carbon.
Methiocarb or Mesurol	040	100501	Carbamate	Hydrolysis.
Propanil	041	28201	Chloropropionanilide	Activated Carbon.
Polyphase [6]	042	107801	Carbamate	Activated Carbon.
Coumafuryl or Fumarin	043	86001	Coumarin	Activated Carbon.
DNOC	044	.....	Phenol	Activated Carbon.
Metribuzin	045	101101	Triazathione	Activated Carbon.
CPA, S&E	046	(*)	2,4-D	Activated Carbon.
MCPB, S&E	047	19202	2,4-D	Activated Carbon.
Aminocarb	048	.....	Carbamate	Hydrolysis.
Etridiazole	049	84701	Heterocyclic	Activated Carbon.
Ethoxyquin	050	55501	Quinolin	Activated Carbon.
Acephate or Orthene	052	103301	Phosphoroamidothioate	Activated Carbon.
Acifluorfen	053	114402	Benzoic Acid	Activated Carbon.
Alachlor	054	90501	Acetanilide	Activated Carbon.
Aldicarb	055	98301	Carbamate	Hydrolysis.
Allethrin	057	(*)	Pyrethrin	Activated Carbon.
Ametryn	058	80801	s-Triazine	Activated Carbon.
Amitraz	059	106201	Iminamide	Activated Carbon.
Atrazine	060	80803	s-Triazine	Hydrolysis.
Bendiocarb	061	105201	Carbamate	Hydrolysis.
Benomyl	062	99101	Carbamate	Hydrolysis.
BHC	063	.....	Lindane	Hydrolysis.
Benzyl Benzoate	064	9501	Ester	Activated Carbon.
Lethane 60	065	.....	Thiocyanate	Activated Carbon.
Bifenox	066	104301	Nitrobenzoate	Activated Carbon.
Biphenyl	067	17002	Aryl	Activated Carbon.
Bromacil (Lithium Salt)	068	(*)	Uracil	Activated Carbon.
Bromoxynil	069	(*)	Benzonitrile	Activated Carbon.
Butachlor	070	.....	Acetanilide	Activated Carbon.
Giv-gard	071	101401	Miscellaneous Organic	Activated Carbon.
Cacodylic Acid	072	(*)	Organoarsenic	Precipitation.
Captafol	073	.....	Phthalimide	Hydrolysis.
Captan	074	81301	Phthalimide	Hydrolysis.
Carbaryl	075	56801	Carbamate	Hydrolysis.
Carbofuran	076	90601	Carbamate	Hydrolysis.
Carbosulfan	077	.....	Carbamate	Activated Carbon.
Chloramben	078	(*)	Benzoic Acid	Activated Carbon.
Chlordane	079	58201	Tricyclic	Activated Carbon.
Chloroneb	080	27301	Aryl Halide	Chemical Oxidation.
Chloropicrin	081	81501	Alkyl Halide	Chemical Oxidation.
Chlorothalonil	082	81901	Chloropropionanilide	Activated Carbon.
Chloroxuron	083	.....	Urea	Activated Carbon.
Stirofos	084	83701	Phosphate	Hydrolysis.
Chlorpyrifos Methyl	085	59102	Phosphorothioate	Hydrolysis.
Chlorpyrifos	086	59101	Phosphorothioate	Chemical Oxidation.
Mancozeb	087	14504	Dithiocarbamate	Activated Carbon.
Bioquin (Copper)	088	24002	Organocopper	Precipitation.
Copper EDTA	089	39105	Organocopper	Precipitation.
Pydrin or Fenvalerate	090	109301	Pyrethrin	Activated Carbon.
Cycloheximide	091	.....	Cyclic Ketone	Activated Carbon.
Dalapon	092	(*)	Alkyl Halide	Activated Carbon.
Dienochlor	093	27501	HCp	Activated Carbon.
Demeton	094	.....	Phosphorothioate	Hydrolysis.
Desmedipham	095	104801	Carbamate	Hydrolysis.
Amobam	096	.....	Miscellaneous Organic	Activated Carbon.
DBCP	097	.....	EDB	Activated Carbon.

TABLE 10 TO PART 455.—LIST OF APPROPRIATE POLLUTION CONTROL TECHNOLOGIES [1]—Continued

PAI name [2]	PAI code [3]	Shaughnessy code [4]	Structural group [5]	Treatment technology
Dicamba	098	(*)	Aryl Halide	Activated Carbon.
Dichlone	099	29601	Quinone	Activated Carbon.
Thiophanate Ethyl	100	103401	Carbamate	Hydrolysis.
Perthane	101	.....	DDT	Activated Carbon.
EXD	102	.....	Dithiocarbamate	Activated Carbon.
Diazinon	103	57801	Phosphorothioate	Hydrolysis.
Diflubenzuron	104	108201	Urea	Activated Carbon.
Dimethoate	106	35001	Phosphorodithioate	Hydrolysis.
Parathion Methyl	107	53501	Phosphorothioate	Hydrolysis.
Dicrotophos	108	35201	Phosphate	Activated Carbon.
Crotoxyphos	109	58801	Phosphate	Activated Carbon.
DCPA	110	78701	Aryl Halide	Activated Carbon.
Trichlorofon	111	57901	Phosphonate	Activated Carbon.
Dinoseb	112	37505	Phenol	Activated Carbon.
Dioxathion	113	37801	Phosphorodithioate	Hydrolysis.
Diphacinone	114	67701	Indandione	Activated Carbon.
Diphenamide	115	36601	Acetamide	Activated Carbon.
Diphenylamine	116	38501	Aryl Amine	Activated Carbon.
MGK 326	117	47201	Ester	Activated Carbon.
Nabonate	118	63301	Isocyanate	Chemical Oxidation.
Diuron	119	35505	Urea	Activated Carbon.
Metasol DGH	120	44303	NR4	Activated Carbon.
Dodine	121	44301	NR4	Activated Carbon.
Endosulfan	122	79401	Tricyclic	Activated Carbon.
Endothall (Endothall S&E)	123	(*)	Bicyclic	Activated Carbon.
Endrin	124	41601	Tricyclic	Activated Carbon.
Ethalfluralin	125	113101	Toluidine	Activated Carbon.
Ethion	126	58401	Phosphorodithioate	Hydrolysis.
Ethoprop	127	41101	Phosphorodithioate	Activated Carbon.
Fenamiphos	128	100601	Phosphoroamidate	Activated Carbon.
Chlorobenzilate	129	28801	Aryl Halide	Activated Carbon.
Butylate	130	41405	Thiocarbamate	Activated Carbon.
Famphur	131	.....	Phosphorothioate	Hydrolysis.
Fenarimol	132	206600	Pyrimidine	Activated Carbon.
Fenthion or Baytex	133	53301	Phosphorothioate	Hydrolysis.
Ferbam	134	34801	Dithiocarbamate	Activated Carbon.
Fluometuron	135	35503	Urea	Activated Carbon.
Fluoroacetamide	136	.....	Acetamide	Activated Carbon.
Folpet	137	81601	Phthalimide	Hydrolysis.
Glyphosate (Glyphosate S&E)	138	(*)	Phosphoroamidate	Chemical Oxidation.
Glyphosine	139	.....	Phosphoroamidate	Activated Carbon.
Heptachlor	140	44801	Tricyclic	Activated Carbon.
Cycloprate	141	.....	Thiocarbamate	Activated Carbon.
Hexazinone	142	107201	s-Triazine	Activated Carbon.
Isofenphos	143	109401	Phosphoroamidothioate	Activated Carbon.
Isopropalin	144	100201	Toluidine	Activated Carbon.
Propham	145	.....	Carbamate	Hydrolysis.
Karabutilate	146	97401	Carbamate	Hydrolysis.
Lindane	147	9001	Lindane	Activated Carbon.
Linuron	148	35506	Urea	Chemical Oxidation.
Malachite Green	149	39504	NR4	Activated Carbon.
Malathion	150	57701	Phosphorodithioate	Hydrolysis.
Maneb	151	14505	Dithiocarbamate	Activated Carbon.
Manam	152	.....	Dithiocarbamate	Activated Carbon.
Mefluidide	153	114002	Carbamate	Activated Carbon.
Methamidophos	154	101201	Phosphoroamidothioate	Activated Carbon.
Methidathion	155	100301	Phosphorodithioate	Activated Carbon.
Methomyl	156	90301	Carbamate	Hydrolysis.
Methoprene	157	(*)	Ester	Activated Carbon.
Methoxychlor	158	34001	DDT	Hydrolysis.
Methyl Bromide	160	53201	Alkyl Halide	Activated Carbon.
Monosodium Methyl Arsenate	161	(*)	Organoarsenic	Precipitation.
Nalco D-2303	163	68102	Thiocyanate	Activated Carbon.
Quinomethionate	164	54101	Miscellaneous Organic	Activated Carbon.
Metolachlor	165	108801	Acetanilide	Activated Carbon.
Mexacarbate	166	.....	Carbamate	Hydrolysis.
Metiram	167	14601	Dithiocarbamate	Activated Carbon.
Monuron TCA	168	35502	Urea	Activated Carbon.
Monuron	169	35501	Urea	Activated Carbon.
Napropamide	170	103001	Carbamate	Activated Carbon.
Deet	171	80301	Toluamide	Activated Carbon.

TABLE 10 TO PART 455.—LIST OF APPROPRIATE POLLUTION CONTROL TECHNOLOGIES [1]—Continued

PAI name [2]	PAI code [3]	Shaughnessy code [4]	Structural group [5]	Treatment technology
Nabam	172	14503	Dithiocarbamate	Chemical Oxidation.
Naled	173	34401	Phosphate	Hydrolysis.
Norea	174	.....	Urea	Activated Carbon.
Norflurazon	175	105801	Heterocyclic	Activated Carbon.
Naptalam or Neptalam	176	30703	Phthalamide	Activated Carbon.
MGK 264	177	57001	Bicyclic	Activated Carbon.
Benfluralin	178	84301	Toluidine	Activated Carbon.
Sulfotepp	179	79501	Phosphorothioate	Activated Carbon.
Aspon	180	.....	Phosphorothioate	Activated Carbon.
Coumaphos	181	36501	Phosphorothioate	Hydrolysis.
Fensulfothion	182	32701	Phosphorothioate	Hydrolysis.
Disulfoton	183	32501	Phosphorodithioate	Hydrolysis.
Fenitrothion	184	105901	Phosphorothioate	Hydrolysis.
Phosmet	185	59201	Phosphorodithioate	Hydrolysis.
Azinphos Methyl (Guthion)	186	58001	Phosphorodithioate	Hydrolysis.
Oxydemeton Methyl	187	58702	Phosphorothioate	Activated Carbon.
Organo-Arsenic Pesticides	188	.....	Organoarsenic	Precipitation.
Organo-Cadmium Pesticides	189	.....	Organocadmium	Precipitation
Organo-Copper Pesticides	190	(*)	Organocopper	Precipitation.
Organo-Mercury Pesticides	191	(*)	Organomercury	Precipitation.
Organo-Tin Pesticides	192	(*)	Organotin	Precipitation.
o-Dichlorobenzene	193	59401	Aryl Halide	Activated Carbon.
Oryzalin	194	104201	Sulfanilamide	Activated Carbon.
Oxamyl	195	103801	Carbamate	Hydrolysis.
Oxyfluorfen	196	111601	Miscellaneous Organic	Activated Carbon.
Bolstar	197	111501	Phosphorodithioate	Activated Carbon.
Sulprofos Oxon	198	.....	Phosphorothioate	Hydrolysis.
Santox (EPN)	199	41801	Phosphorodithioate	Hydrolysis.
Fonofos	200	41701	Phosphorodithioate	Hydrolysis.
Propoxur	201	47802	Carbamate	Hydrolysis.
p-Dichlorobenzene	202	61501	Aryl Halide	Activated Carbon.
Parathion Ethyl	203	57501	Phosphorothioate	Hydrolysis.
Pendimethalin	204	108501	Benzeneamine	Activated Carbon.
PCNB	205	56502	Aryl Halide	Activated Carbon.
PCP or Penta	206	(*)	Phenol	Activated Carbon.
Perfluidone	207	.....	Sulfonamide	Activated Carbon.
Permethrin	208	109701	Pyrethrin	Activated Carbon.
Phenmedipham	209	98701	Carbamate	Hydrolysis.
Nemazine	210	64501	Heterocyclic	Activated Carbon.
Phorate	212	57201	Phosphorodithioate	Hydrolysis.
Phosalone	213	97701	Phosphorodithioate	Hydrolysis.
Phosphamidon	214	18201	Phosphate	Hydrolysis.
Picloram	215	(*)	Pyridine	Activated Carbon.
Piperonyl Butoxide	216	67501	Ester	Activated Carbon.
PBED or WSCP (Busan 77)	217	69183	NR4	Activated Carbon.
Busan 85 or Arylane	218	34803	Dithiocarbamate	Chemical Oxidation.
Busan 40	219	102901	Dithiocarbamate	Chemical Oxidation.
KN Methyl	220	39002	Dithiocarbamate	Chemical Oxidation.
Metasol J26	221	101301	Miscellaneous Organic	Activated Carbon.
Profenofos	222	111401	Phosphorothioate	Activated Carbon.
Prometon or Caparol	223	80804	s-Triazine	Chemical Oxidation.
Prometryn	224	80805	s-Triazine	Activated Carbon.
Propargite	225	97601	Miscellaneous Organic	Activated Carbon.
Propazine	226	80808	s-Triazine	Activated Carbon.
Propionic Acid	227	77702	Alkyl Acid	Activated Carbon.
Previcur N	228	119301	Carbamate	Hydrolysis.
Pyrethrin Coils	229	69004	Pyrethrin	Activated Carbon.
Pyrethrum I	230	69001	Pyrethrin	Hydrolysis.
Pyrethrum II	231	69002	Pyrethrin	Hydrolysis.
Pyrethrins	232	(*)	Pyrethrin	Hydrolysis.
Resmethrin	233	(*)	Pyrethrin	Activated Carbon.
Fenchlorphos or Ronnel	234	58301	Phosphorothioate	Hydrolysis.
Mexide or Rotenone	235	71003	Miscellaneous Organic	Activated Carbon.
DEF	236	74801	Phosphorotrithioate	Activated Carbon.
Siduron or Tupersan	237	35509	Urea	Activated Carbon.
Silvex	238	(*)	2,4-D	Activated Carbon.
Simazine	239	80807	s-Triazine	Activated Carbon.
Sodium Bentazon	240	103901	Heterocyclic	Chemical Oxidation.
Carbam-S or Sodam	241	34804	Dithiocarbamate	Chemical Oxidation.
Sodium Fluoroacetate	242	75003	Acetamide	Activated Carbon.
Vapam or Metham Sodium	243	39003	Dithiocarbamate	Chemical Oxidation.

TABLE 10 TO PART 455.—LIST OF APPROPRIATE POLLUTION CONTROL TECHNOLOGIES [1]—Continued

PAI name [2]	PAI code [3]	Shaughnessy code [4]	Structural group [5]	Treatment technology
Sulfoxide	244	57101	Miscellaneous Organic	Activated Carbon.
Cycloate or Ro-Neet	245	41301	Thiocarbamate	Activated Carbon.
EPrecipitationC or Eptam	246	41401	Thiocarbamate	Activated Carbon.
Molinate	247	41402	Thiocarbamate	Activated Carbon.
Pebulate or Tillman	248	41403	Thiocarbamate	Activated Carbon.
Vernolate or Vernam	249	41404	Thiocarbamate	Activated Carbon.
HPrecipitationMS	250	35604	Thiosulphonate	Activated Carbon.
Bensulide or Betesan	251	9801	Phosphorodithioate	Activated Carbon.
Tebuthiuron	252	105501	Urea	Activated Carbon.
Temephos	253	59001	Phosphorothioate	Hydrolysis.
Terbacil	254	12701	Uracil	Activated Carbon.
Terbufos or Counter	255	105001	Phosphorodithioate	Activated Carbon.
Terbuthylazine	256	80814	s-Triazine	Activated Carbon.
Terbutryn	257	80813	s-Triazine	Activated Carbon.
Tetrachlorophenol	258	63004	Phenol	Activated Carbon.
Dazomet	259	35602	Heterocyclic	Chemical Oxidation.
Thiophanate Methyl	260	102001	Carbamate	Hydrolysis.
Thiram	261	79801	Dithiocarbamate	Activated Carbon.
Toxaphene	262	80501	Bicyclic	Activated Carbon.
Merphos	263	74901	Phosphorotrithioate	Hydrolysis.
Trifluralin or Treflan	264	36101	Toluidine	Activated Carbon.
Warfarin	265	(*)	Coumarin	Activated Carbon.
Zinc MBT	266	51705	Organozinc	Precipitation.
Zineb	267	14506	Dithiocarbamate	Activated Carbon.
Ziram	268	34805	Dithiocarbamate	Activated Carbon.
Triallate	269	78802	Thiocarbamate	Activated Carbon.
Phenothrin	270	69005	Pyrethrin	Activated Carbon.
Tetramethrin	271	69003	Pyrethrin	Activated Carbon.
Chloropropham	272	18301	Carbamate	Hydrolysis.
Non-272 PAIs				
CFC 11	.....	13	Alkyl Halide	Activated Carbon.
CFC 12	.....	14	Alkyl Halide	Activated Carbon.
Polyethylene	.....	152	Polymer	Activated Carbon.
Acrolein	.....	701	Alcohol	Activated Carbon.
Dimethyl-m-dioxan-4-ol acetate	.....	1001	Heterocyclic	Activated Carbon.
Dodecyl alcohol	.....	1509	Alcohol	Activated Carbon.
Tetradecyl alcohol	.....	1510	Alcohol	Activated Carbon.
Rosin amine D acetate	.....	4201	Alkyl Acid	Activated Carbon.
Dihydroabietylamine acetate	.....	4213	Alkyl Acid	Activated Carbon.
Amitrole	.....	4401	Heterocyclic	Activated Carbon.
Allyl isothiocyanate	.....	4901	Thiocyanate	Activated Carbon.
AMS	.....	5501	Inorganic	Pollution Prevention.
Calcium sulfate	.....	5602	Inorganic	Pollution Prevention.
Tartar emetic	.....	6201	Inorganic	Pollution Prevention.
Diphenylstibene 2-ethylhexanoate	.....	6202	Aryl	Activated Carbon.
Streptomycin	.....	6306	Heterocyclic	Activated Carbon.
Oxytetracycline hydrochloride	.....	6308	Phthalamide	Activated Carbon.
Streptomycin sesquisulfate	.....	6310	Heterocyclic	Activated Carbon.
Neomycin sulfate	.....	6313	Benzeneamine	Activated Carbon.
Antimycin A	.....	6314	Heterocyclic	Activated Carbon.
Calcium oxytetracycline	.....	6321	Phthalamide	Activated Carbon.
Espesol 3A	.....	6601	Phosphorothioate	Activated Carbon.
Arsenic acid	.....	6801	Metallic	Precipitation.
Arsenic acid anhydride	.....	6802	Metallic	Precipitation.
Arsenous acid anhydride	.....	7001	Metallic	Precipitation.
Copper oxychloride	.....	8001	Metallic	Precipitation.
Basic cupric sulfate	.....	8101	Metallic	Precipitation.
Basic copper III—zinc sulfate complex (Declare copper and.	.....	8102	Metallic	Precipitation.
Bromophos	.....	8706	Phosphorothioate	Activated Carbon.
Benzyl bromoacetate	.....	8710	Benzoic acid	Activated Carbon.
Benzoic acid	.....	9101	Benzoic acid	Activated Carbon.
Benzyl diethyl ((2,6-xylylcarbamoyl)methyl) ammonium benzoate.	.....	9106	NR4	Activated Carbon.
Benzyl alcohol	.....	9502	Aryl	Activated Carbon.
3–Chloro-p-toluidine hydrochloride	.....	9901	Chloropropionanilide	Activated Carbon.
Butoxyethoxy)ethyl thiocyanate	.....	10002	Thiocyanate	Activated Carbon.
2-Naphthol	.....	10301	Phenol	Activated Carbon.
Boric acid	.....	11001	Inorganic	Pollution Prevention.
Barium metaborate	.....	11101	Inorganic	Pollution Prevention.

TABLE 10 TO PART 455.—LIST OF APPROPRIATE POLLUTION CONTROL TECHNOLOGIES [1]—Continued

PAI name [2]	PAI code [3]	Shaughnessy code [4]	Structural group [5]	Treatment technology
Boron sodium oxide (B8Na2O13), tetrahydrate (12280–03–4).	.....	11103	Inorganic	Pollution Prevention.
Sodium metaborate (NaBO2)	.....	11104	Inorganic	Pollution Prevention.
Boron sodium oxide (B8Na2O13) (12008–41–2).	.....	11107	Inorganic	Pollution Prevention.
Boron sodium oxide (B4Na2O7), pentahydrate (12179–04–3).	.....	11110	Inorganic	Pollution Prevention.
Boron sodium oxide (B4Na2O7) (1330–43–4).	.....	11112	Inorganic	Pollution Prevention.
Polybutene	.....	11402	Polymer	Activated Carbon.
Polyisobutylene	.....	11403	Polymer	Activated Carbon.
Butyl cellosolve	.....	11501	Alcohol	Activated Carbon.
Butoxypolypropylene glycol	.....	11901	Polymer	Activated Carbon.
Neburon (ANSI)	.....	12001	Chloropropionanilide	Activated Carbon.
Methyltrimethylenedioxy)bis(4-methyl-1,3,2-dioxaborinane).	.....	12401	Bicyclic	Activated Carbon.
Oxybis(4,4,6-trimethyl-1,3,2-dioxaborinane)	.....	12402	Bicyclic	Activated Carbon.
Cadmium chloride	.....	12902	Metallic	Precipitation.
Lead arsenate, basic	.....	13502	Metallic	Precipitation.
Lead arsenate	.....	13503	Metallic	Precipitation.
Sodium arsenate	.....	13505	Metallic	Precipitation.
Sodium arsenite	.....	13603	Metallic	Precipitation.
Potassium bromide	.....	13903	Inorganic	Pollution Prevention.
Camphor	.....	15602	Bicyclic	Activated Carbon.
Carbon disulfide	.....	16401	Inorganic	Pollution Prevention.
Carbon tetrachloride	.....	16501	Alkyl Halide	Activated Carbon.
Barban (ANSI)	.....	17601	Carbamate	Activated Carbon.
Chloro-2-propenyl)-3,5,7,triaza-1-azo niatricyclo(3.3.1.1)sup.	.....	17902	Tricyclic	Activated Carbon.
Chlormequat chloride	.....	18101	NR4	Activated Carbon.
Chloromethoxypropylmercuric acetate	.....	18401	Metallic	Precipitation.
Allidochlor	.....	19301	Acetanilide	Activated Carbon.
Chromic acid	.....	21101	Metallic	Precipitation.
Chromic oxide	.....	21103	Metallic	Precipitation.
Cresol (unspec) (Cresylic acid)	.....	22101	Phenol	Activated Carbon.
Cresol	.....	22102	Phenol	Activated Carbon.
Copper (metallic)	.....	22501	Metallic	Precipitation.
Copper ammonium carbonate	.....	22703	Metallic	Precipitation.
Copper carbonate	.....	22901	Metallic	Precipitation.
Copper hydroxide	.....	23401	Metallic	Precipitation.
Copper chloride hydroxide (Cu2Cl(OH)3)	.....	23501	Metallic	Precipitation.
Copper oxychloride sulfate	.....	23503	Metallic	Precipitation.
Copper sulfate	.....	24401	Metallic	Precipitation.
Copper (from triethanolamine complex)	.....	24403	Metallic	Precipitation.
Copper as metallic (in the form of chelates of copper citrat).	.....	24405	Metallic	Precipitation.
Copper as elemental from copper—ethylenediamine complex.	.....	24407	Metallic	Precipitation.
Copper sulfate (anhydrous)	.....	24408	Metallic	Precipitation.
Copper(I) oxide	.....	25601	Metallic	Precipitation.
Cuprous thiocyanate	.....	25602	Metallic	Precipitation.
Cyclohexane	.....	25901	Aryl	Activated Carbon.
Cyclohexanone	.....	25902	Cyclic Ketone	Activated Carbon.
Dichlobenil	.....	27401	Chloropropionanilide	Activated Carbon.
Diquat dibromide	.....	32201	NR4	Activated Carbon.
Dimethrin (ANSI)	.....	34101	Pyrethrin	Activated Carbon.
Dicapthon	.....	34502	Phosphorothioate	Activated Carbon.
Ziram, cyclohexylamine complex	.....	34806	Dithiocarbamate	Activated Carbon.
Butyl dimethyltrithioperoxycarbamate	.....	34807	Dithiocarbamate	Activated Carbon.
Daminozide	.....	35101	Acetanilide	Activated Carbon.
Bis(trichloromethyl) sulfone	.....	35601	Miscellaneous Organic	Activated Carbon
Bis(bromoacetoxy)-2-butene	.....	35605	Alkyl Halide	Activated Carbon.
Dazomet, sodium salt	.....	35607	Heterocyclic	Activated Carbon.
Butonate	.....	35701	Phosphonate	Activated Carbon.
Trifluoro-4-nitro-m-cresol(**)=alpha,alpha,alpha-.	.....	6201	Phenol	Activated Carbon.
Triethanolamine dinoseb (2-sec-Butyl-4,6-dinitrophenol).	.....	37506	Phenol	Activated Carbon.
Sodium 4,6-dinitro-o-cresylate	.....	37508	Phenol	Activated Carbon.
Dinitrophenol	.....	37509	Phenol	Activated Carbon.

TABLE 10 TO PART 455.—LIST OF APPROPRIATE POLLUTION CONTROL TECHNOLOGIES [1]—Continued

PAI name [2]	PAI code [3]	Shaughnessy code [4]	Structural group [5]	Treatment technology
Alkanol* amine dinoseb (2-sec-butyl-4,6-dinitrophenol) *(s.	.....	37511	Phenol	Activated Carbon.
Sodium dinoseb (2-sec-Butyl-4,6-dinitrophenol).	.....	37512	Phenol	Activated Carbon.
Nitrilotriacetic acid, trisodium salt	.....	39106	Acetamide	Activated Carbon.
Trisodium(2-hydroxyethyl)ethylene diaminetriacetate.	.....	39109	Acetanilide	Activated Carbon.
Ammonium ethylenediaminetetraacetate	.....	39117	Acetamide	Activated Carbon.
Pentasodium diethylenetriaminepentaacetate.	.....	39120	Acetanilide	Activated Carbon.
Ethyl-1,3-hexanediol	.....	41001	Alcohol	Activated Carbon.
Ethylene	.....	41901	Miscellaneous Organic	Pollution Prevention.
EDC	.....	42003	EDB	Activated Carbon.
Methylene chloride	.....	42004	Alkyl Halide	Activated Carbon.
Methoxyethanol	.....	42202	Alcohol	Activated Carbon.
Ethylene glycol	.....	42203	Alcohol	Activated Carbon.
Butylene glycol	.....	42205	Alcohol	Activated Carbon.
Ethylene oxide	.....	42301	Miscellaneous Organic	Pollution Prevention.
Copper(II) oxide	.....	42401	Metallic	Precipitation.
Cuprous and cupric oxide, mixed	.....	42403	Metallic	Precipitation.
Propylene oxide	.....	42501	Miscellaneous Organic	Pollution Prevention.
Formaldehyde	.....	43001	Miscellaneous Organic	Pollution Prevention.
Paraformaldehyde	.....	43002	Polymer	Activated Carbon.
Bis(2-butylene) tetrahydro-2-furaldehyde	.....	43302	Tricyclic	Activated Carbon.
Giberellic acid	.....	43801	Tricyclic	Activated Carbon.
Potassium gibberellate	.....	43802	Tricyclic	Activated Carbon.
Glutaral	.....	43901	Alcohol	Activated Carbon.
Copper citrate	.....	44005	Metallic	Precipitation.
Methyl nonyl ketone	.....	44102	Miscellaneous Organic	Activated Carbon.
Methyl-2-pentanone	.....	44105	Miscellaneous Organic	Activated Carbon.
Monosodium 2,2'-methylenebis (3,4,6-trichlorophenate).	.....	44902	Chlorophene	Activated Carbon.
Potassium 2,2'-methylenebis (3,4,6-trichlorophenate).	.....	44904	Chlorophene	Activated Carbon.
Hexachloroepoxyoctahydro-endo, exo-dimethanoaphthalene 85%.	.....	45001	Tricyclic	Activated Carbon.
Chlorhexidine diacetate	.....	45502	Chloropropionanilide	Activated Carbon.
Hydrocyanic acid	.....	45801	Inorganic	Activated Carbon.
Hydroxyethyl octyl sulfide	.....	46301	Alcohol	Activated Carbon.
Heptadecenyl-2-(2-hydroxyethyl)-2-i midazolinium chloride.	.....	46608	NR4	Activated Carbon.
Hydroxyethyl)-2-alkyl-2-imidazoline (as in fatty acids of t.	.....	46609	NR4	Activated Carbon.
IBA	.....	46701	Bicyclic	Activated Carbon.
Dihydropyrone	.....	46801	Cyclic ketone	Activated Carbon.
Butoxypolypropoxypolyethoxyethanol-iodine complex.	.....	46901	Polymer	Activated Carbon.
Polyethoxypolypropoxyethanol-iodine complex.	.....	46904	Polymer	Activated Carbon.
Use code no. 046904 (polyethoxypolypropoxy ethanol-iodine complex).	.....	46909	Polymer	Activated Carbon.
Iodine-potassium iodide complex	.....	46917	Inorganic	Pollution Prevention.
Alkyl-omega-hydroxypoly(oxyethylen e)-iodine complex *(100%.	.....	46921	Polymer	Activated Carbon.
Lead acetate	.....	48001	Metallic	Precipitation.
Nickel sulfate hexahydrate	.....	50505	Metallic	Precipitation.
Maleic hydrazide, diethanolamine salt	.....	51502	Hydrazide	Activated Carbon.
Maleic hydrazide, potassium salt	.....	51503	Hydrazide	Activated Carbon.
Sodium 2-mercaptobenzothiolate	.....	51704	Heterocyclic	Activated Carbon.
Mercuric chloride	.....	52001	Metallic	Precipitation.
Mercurous chloride	.....	52201	Metallic	Precipitation.
Metaldehyde	.....	53001	Miscellaneous Organic	Activated Carbon.
Methylated naphthalenes	.....	54002	Aryl	Activated Carbon.
Sodium 2,2'-methylenebis(4-chlorophenate)	.....	55005	Chlorophene	Activated Carbon.
Naphthalene	.....	55801	Aryl	Activated Carbon.
NAD	.....	56001	Benzoic Acid	Activated Carbon.
NAA (1–Naphthaleneacetic Acid)	.....	56002	Benzoic Acid	Activated Carbon.
Potassium 1-naphthaleneacetate	.....	56003	Benzoic Acid	Activated Carbon.
Ammonium 1-naphthaleneacetate	.....	56004	Benzoic Acid	Activated Carbon.
Sodium 1-naphthaleneacetate	.....	56007	Benzoic Acid	Activated Carbon.

TABLE 10 TO PART 455.—LIST OF APPROPRIATE POLLUTION CONTROL TECHNOLOGIES [1]—Continued

PAI name [2]	PAI code [3]	Shaughnessy code [4]	Structural group [5]	Treatment technology
Ethyl 1-naphthaleneacetate	.....	56008	Benzoic Acid	Activated Carbon.
Nitrophenol	.....	56301	Phenol	Activated Carbon.
Nicotine	.....	56702	Pyridine	Activated Carbon.
Carbophenothion (ANSI)	.....	58102	Phosphorodithioate	Activated Carbon.
Sodium 5-chloro-2-(4-chloro-2-(3-(3,4-dichlorophenyl)ureido).	.....	58802	Aryl Halide	Activated Carbon.
Monocrotophos	.....	58901	Phosphate	Activated Carbon.
Chlordimeform	.....	59701	Chloropropionanilide	Activated Carbon.
Chlordimeform hydrochloride	.....	59702	Chloropropionanilide	Activated Carbon.
Thiabendazole hypophosphite	.....	60102	Hydrazide	Activated Carbon.
Hexachlorobenzene	.....	61001	Lindane	Activated Carbon.
Butyl paraben	.....	61205	Phenol	Activated Carbon.
Paraquat dichloride	.....	61601	Pyridine	Activated Carbon.
Chloro-4-phenylphenol	.....	62206	Chlorophene	Activated Carbon.
Chloro-2-phenylphenol	.....	62208	Chlorophene	Activated Carbon.
Chloro-2-biphenylol, potassium salt	.....	62209	Chlorophene	Activated Carbon.
Chloro-2-phenylphenol	.....	62210	Chlorophene	Activated Carbon.
Chloro-2-phenylphenol, potassium salt	.....	62211	Chlorophene	Activated Carbon.
Sodium phenate	.....	64002	Phenol	Activated Carbon.
Butylphenol, sodium salt	.....	64115	Phenol	Activated Carbon.
Ammonium 2-phenylphenate	.....	64116	Phenol	Activated Carbon.
Chloro-2-cyclopentylphenol	.....	64202	Chlorophene	Activated Carbon.
Bithionolate sodium	.....	64203	Chlorophene	Activated Carbon.
Chloro-3-cresol	.....	64206	Chlorophene	Activated Carbon.
Sodium 2,4,5-trichlorophenate	.....	64217	Chlorophene	Activated Carbon.
Aluminum phosphide	.....	66501	Inorganic	Pollution Prevention.
Phosphorus	.....	66502	Inorganic	Pollution Prevention.
Magnesium phosphide	.....	66504	Inorganic	Pollution Prevention.
1-(Alkyl*amino)-3-aminopropane* (Fatty acids of coconut oil).	.....	67301	Iminamide	Activated Carbon.
Alkyl* amino)-3-aminopropane *(53%C12, 19%C14, 8.5%C16, 7%C8.	.....	67305	Iminamide	Activated Carbon.
Alkyl*amino)-3-aminopropane benzoate*(fatty acids of coconut.	.....	67307	Iminamide	Activated Carbon.
Alkyl* dipropoxyamine *(47% C12, 18% C14, 10% C18, 9% C10, 8.	.....	67308	Iminamide	Activated Carbon.
Alkyl*amino)-3-aminopropane hydroxyacetate* (acids of coconut.	.....	67309	Iminamide	Activated Carbon.
Alkyl* amino)-3-aminopropane *(42%C12, 26%C18, 15%C14, 8%C16.	.....	67310	Iminamide	Activated Carbon.
Alkyl*amino)-3-aminopropane diacetate* (fatty acids of coconut.	.....	67313	Iminamide	Activated Carbon.
Octadecenyl-1,3-propanediamine monogluconate.	.....	67316	Acetamide	Activated Carbon.
Alkyl* amine acetate *(5%C8, 7%C10, 54%C12, 19%C14, 8%C16,.	.....	67329	Iminamide	Activated Carbon.
Pindone sodium salt	.....	67704	Indandione	Activated Carbon.
Diphacinone, sodium salt	.....	67705	Indandione	Activated Carbon.
Isovaleryl-1,3-indandione, calcium salt	.....	67706	Indandione	Activated Carbon.
Methyl isothiocyanate	.....	68103	Thiocyanate	Pollution Prevention.
Potassium dichromate	.....	68302	Inorganic	Pollution Prevention.
Sodium chromate	.....	68303	Inorganic	Pollution Prevention.
Sodium dichromate	.....	68304	Metallic	Precipitation.
Alkenyl* dimethyl ethyl ammonium bromide *(90%C18', 10%C16').	.....	69102	NR4	Activated Carbon.
Alkyl*-N-ethyl morpholinium ethyl sulfate *(92%C18, 8%C16).	.....	69113	Heterocyclic	Activated Carbon.
Alkyl* isoquinolinium bromide *(50% C12, 30% C14, 17% C16, 3).	.....	69115	Quinolin	Activated Carbon.
Alkyl* methyl isoquinolinium chloride *(55%C14, 12%C12, 17%C).	.....	69116	Quinolin	Activated Carbon.
Cetyl trimethyl ammonium bromide	.....	69117	NR4	Activated Carbon.
Cetyl pyridinium bromide	.....	69118	Pyridine	Activated Carbon.
Dodecyl dimethyl benzyl ammonium naphthenate.	.....	69127	NR4	Activated Carbon.
Alkyl* dimethyl ethylbenzyl ammonium cyclohexylsulfamate *(5).	.....	69135	NR4	Activated Carbon.
Alkyl*-N-ethyl morpholinium ethyl sulfate *(66%C18, 25%C16).	.....	69147	Heterocyclic	Activated Carbon.
Alkyl* trimethyl ammonium bromide *(95%C14, 5%C16).	.....	69153	NR4	Activated Carbon.

TABLE 10 TO PART 455.—LIST OF APPROPRIATE POLLUTION CONTROL TECHNOLOGIES [1]—Continued

PAI name [2]	PAI code [3]	Shaughnessy code [4]	Structural group [5]	Treatment technology
Benzyl((dodecylcarbamoyl) methyl)di methyl ammonium chloride.	.....	69159	NR4	Activated Carbon.
Cetyl pyridinium chloride	.....	69160	Pyridine	Activated Carbon.
Alkyl* dimethyl ethyl ammonium bromide *(85%C16, 15%C18).	.....	69186	NR4	Activated Carbon.
Cetyl-N-ethylmorpholinium ethyl sulfate	.....	69187	Heterocyclic	Activated Carbon.
Use code no. 069102 (Alkenyl* Dimethyl Ethyl Ammonium bromide).	.....	69198	NR4	Activated Carbon.
p-Aminopyridine	.....	69201	Pyridine	Activated Carbon.
Nitrapyrin (ANSI)	.....	69203	Pyridine	Activated Carbon.
Alkyl pyridines	.....	69205	Pyridine	Activated Carbon.
Pyrazon (ANSI)	.....	69601	Heterocyclic	Activated Carbon.
Capsaicin (in oleoresin of capsicum)	.....	70701	Phenol	Activated Carbon.
Ryanodine	.....	71502	Tricyclic	Activated Carbon.
Silver	.....	72501	Inorganic	Pollution Prevention.
Silver chloride	.....	72506	Inorganic	Pollution Prevention.
Silver thiuronium acrylate co-polymer	.....	72701	Polymer	Activated Carbon.
Sodium chlorate	.....	73301	Inorganic	Pollution Prevention.
Calcium cyanide	.....	74001	Inorganic	Pollution Prevention.
Sodium cyanide	.....	74002	Inorganic	Pollution Prevention.
Cryolite	.....	75101	Inorganic	Pollution Prevention.
Sodium fluoride	.....	75202	Inorganic	Pollution Prevention.
Ammonium fluosilicate	.....	75301	Inorganic	Pollution Prevention.
Sodium fluosilicate	.....	75306	Inorganic	Pollution Prevention.
Potassium iodide	.....	75701	Inorganic	Pollution Prevention.
Potassium tetrathionate	.....	75903	Inorganic	Pollution Prevention.
Potassium nitrate	.....	76103	Inorganic	Pollution Prevention.
Sodium nitrate	.....	76104	Inorganic	Pollution Prevention.
Sodium nitrite	.....	76204	Inorganic	Pollution Prevention.
Benzenesulfonamide, N-chloro-, sodium salt	.....	76501	Sulfonamide	Activated Carbon.
Salicyclic acid	.....	76202	Benzoic Acid	Activated Carbon.
Ethoxyethyl p-methoxycinnamate	.....	76604	Aryl	Activated Carbon.
Calcium polysulfide	.....	76702	Polymer	Activated Carbon.
Strychnine	.....	76901	Tricyclic	Activated Carbon.
Strychnine sulfate	.....	76902	Tricyclic	Activated Carbon.
Niclosamide	.....	77401	Chlorobenzamide	Activated Carbon.
Dibromosalicylamilide	.....	77402	Chlorobenzamide	Activated Carbon.
Tribromsalan	.....	77404	Chlorobenzamide	Activated Carbon.
Dibromosalicylanilide	.....	77405	Chlorobenzamide	Activated Carbon.
Chlorosalicylanilide	.....	77406	Chlorobenzamide	Activated Carbon.
Sulfur	.....	77501	Inorganic	Pollution Prevention.
Sulfaquinoxaline	.....	77901	Sulfanilamide	Activated Carbon.
Sulfacetamide	.....	77904	Sulfanilamide	Activated Carbon.
Sulfuryl fluoride	.....	78003	Inorganic	Pollution Prevention.
Sodium bisulfite	.....	78201	Inorganic	Pollution Prevention.
Tetrachloroethylene	.....	78501	EDB	Activated Carbon.
Ethoxylated isooctylphenol	.....	79004	Phenol	Activated Carbon.
Lauric diethanolamide	.....	79018	Acetanilide	Activated Carbon.
Triethanolamine oleate	.....	79025	NR4	Activated Carbon.
Dioctyl sodium sulfosuccinate	.....	79027	Thiosulfonate	Activated Carbon.
Use code no. 069179 (alkyl*mono-ethanolamide).	.....	79036	Miscellaneous Organic	Activated Carbon.
Alkyl* diethanolamide *(70%C12, 30%C14)	.....	79045	Miscellaneous Organic	Activated Carbon.
Tetradecyl formate	.....	79069	Alkyl Acid	Activated Carbon.
Polyoxyethylene sorbitol oleate-laurate	.....	79075	Polymer	Activated Carbon.
Polyethoxylated stearylamine	.....	79094	Polymer	Activated Carbon.
Capric diethanolamide	.....	79099	Acetanilide	Activated Carbon.
Calcium thiosulfate	.....	80101	Inorganic	Pollution Prevention.
Ammonium thiosulfate	.....	80103	Inorganic	Pollution Prevention.
Thymoxydichloroacetic acid	.....	80401	Benzoic Acid	Activated Carbon.
Thymol	.....	80402	Phenol	Activated Carbon.
Sodium trichloroacetate	.....	81001	Alkyl Halide	Activated Carbon.
Trichloroacetic acid	.....	81002	Alkyl Halide	Activated Carbon.
Hexahydro-1,3,5-tris(2-hydroxyethyl)-s-triazine.	.....	83301	s-Triazine	Activated Carbon.
2-(Hydroxymethyl)-2-nitro-1,3-propanediol	.....	83902	Alcohol	Activated Carbon.
Bomyl	.....	84201	Phosphate	Activated Carbon.
Turpentine	.....	84501	Miscellaneous Organic	Activated Carbon.
Chloro-1-(2,5-dichlorophenyl)vinyl) O,O-diethyl phosphorothi.	.....	84901	Phosphorothioate	Activated Carbon.
Zinc chloride	.....	87801	Metallic	Precipitation.

TABLE 10 TO PART 455.—LIST OF APPROPRIATE POLLUTION CONTROL TECHNOLOGIES [1]—Continued

PAI name [2]	PAI code [3]	Shaughnessy code [4]	Structural group [5]	Treatment technology
Zinc 2-pyridinethiol-1-oxide	.....	88002	Metallic	Precipitation.
Hydroxy-2-(1H)-pyridinethione, sodium salt	.....	88004	Pyridine	Activated Carbon.
Omadine TBAO	.....	88005	Pyridine	Activated Carbon.
Zinc naphthenate	.....	88301	Metallic	Precipitation.
Zinc oxide	.....	88502	Metallic	Precipitation.
Zinc phosphide (Zn3P2)	.....	88601	Metallic	Precipitation.
Zinc phenol sulfonate	.....	89002	Metallic	Precipitation.
Zinc sulfate, basic	.....	89101	Metallic	Precipitation.
Dimetilan	.....	90101	Carbamate	Activated Carbon.
Carboxin	.....	90201	Heterocyclic	Activated Carbon.
Oxycarboxin	.....	90202	Heterocyclic	Activated Carbon.
Benzocaine	.....	97001	Benzeneamine	Activated Carbon.
Piperalin	.....	97003	2,4-D	Activated Carbon.
Tetracaine hydrochloride	.....	97005	Benzeneamine	Activated Carbon.
Formetanate hydrochloride	.....	97301	Toluamide	Activated Carbon.
Azacosterol HCl	.....	98101	Tricyclic	Activated Carbon.
Use code no. 039502 (gentian violet)	.....	98401	NR4	Activated Carbon.
Ammonium alum	.....	98501	Inorganic	Pollution Prevention.
Bismuth subgallate	.....	98601	Metallic	Precipitation.
Chlorflurenol, methyl ester	.....	98801	Aryl Halide	Activated Carbon.
Benzisothiazolin-3-one	.....	98901	Heterocyclic	Activated Carbon.
Methyl 2-benzimidazolecarbamate phosphate.	.....	99102	Carbamate	Activated Carbon.
Ethephon	.....	99801	Phosphate	Activated Carbon.
Pentanethiol	.....	100701	Miscellaneous Organic	Activated Carbon.
Nitrobutyl)morpholine	.....	100801	Heterocyclic	Activated Carbon.
Ethyl-2-nitrotrimethylene)dimorpholine	.....	100802	Heterocyclic	Activated Carbon.
Tolyl diiodomethyl sulfone	.....	101002	Thiosulfonate	Activated Carbon.
Isobutyric acid	.....	101502	Alkyl Acid	Activated Carbon.
Dibromo-3-nitrilopropionamide	.....	101801	Acetamide	Activated Carbon.
Polyethoxylated oleylamine	.....	101901	Acetamide	Activated Carbon.
Dinitramine (ANSI)	.....	102301	Nitrobenzoate	Activated Carbon.
Phenylethyl propionate	.....	102601	Phenylcrotonate	Activated Carbon.
Eugenol	.....	102701	Phenol	Activated Carbon.
Tricosene	.....	103201	Miscellaneous Organic	Activated Carbon.
Tricosene	.....	103202	Miscellaneous Organic	Activated Carbon.
Sodium 1,4′,5′-trichloro-2′-(2,4,5-trichlorophenoxy)methanes.	.....	104101	2,4-D	Activated Carbon.
Hexahydro-1,3,5-tris(2-hydroxypropyl)-s-triazine.	.....	105601	s-Triazine	Activated Carbon.
Methazole	.....	106001	Hydrazide	Activated Carbon.
Difenzoquat methyl sulfate	.....	106401	Hydrazide	Activated Carbon.
Butralin	.....	106501	Benzeneamine	Activated Carbon.
Fosamine ammonium	.....	106701	Carbamate	Activated Carbon.
Asulam	.....	106901	Carbamate	Activated Carbon.
Sodium asulam	.....	106902	Carbamate	Activated Carbon.
Hydroxymethoxymethyl-1-aza-3,7-dioxabicyclo(3.3.0)octane.	.....	107001	Bicyclic	Activated Carbon.
Hydroxymethyl-1-aza-3,7-dioxabicyclo(3.3.0)octane.	.....	107002	Bicyclic	Activated Carbon.
Hydroxypoly(methyleneoxy)* methyl-1-aza-3,7-dioxabicyclo(3.3).	.....	107003	Bicyclic	Activated Carbon.
Chloro-2-methyl-3(2H)-isothiazolone	.....	107103	Heterocyclic	Activated Carbon.
Methyl-3(2H)-isothiazolone	.....	107104	Heterocyclic	Activated Carbon.
Trimethoxysilyl)propyl dimethyl octadecyl ammonium chloride.	.....	107401	NR4	Activated Carbon.
Kinoprene	.....	107502	Ester	Activated Carbon.
Triforine (ANSI)	.....	107901	Hydrazide	Activated Carbon.
Pirimiphos-methyl (ANSI)	.....	108102	Phosphorothioate	Activated Carbon.
Thiobencarb	.....	108401	Thiocarbamate	Activated Carbon.
Ancymidol (ANSI)	.....	108601	Pyrimidine	Activated Carbon.
Oxadiazon (ANSI)	.....	109001	Hydrazide	Activated Carbon.
Mepiquat chloride	.....	109101	NR4	Activated Carbon.
Fluvalinate	.....	109302	Toluamide	Activated Carbon.
Chloro-N-(hydroxymethyl)acetamide	.....	109501	Acetamide	Activated Carbon.
Dikegulac sodium	.....	109601	Tricyclic	Activated Carbon.
Iprodione (ANSI)	.....	109801	Hydrazide	Activated Carbon.
Phenylmethyl)-9-(tetrahydro-2H-pyran-2-yl)-9H-purin-6-amine.	.....	110001	Pyrimidine	Activated Carbon.
Prodiamine	.....	110201	Benzeneamine	Activated Carbon.
Erioglaucine	.....	110301	Benzeneamine	Activated Carbon.

TABLE 10 TO PART 455.—LIST OF APPROPRIATE POLLUTION CONTROL TECHNOLOGIES [1]—Continued

PAI name [2]	PAI code [3]	Shaughnessy code [4]	Structural group [5]	Treatment technology
Tartrazine	.....	110302	Hydrazide	Activated Carbon.
Dodemorph acetate	.....	110401	Heterocyclic	Activated Carbon.
Ethofumesate (ANSI)	.....	110601	Bicyclic	Activated Carbon.
Aldoxycarb (ANSI)	.....	110801	Carbamate	Activated Carbon.
Diclofop-methyl	.....	110902	Aryl Halide	Activated Carbon.
Bromo-1-(bromomethyl)-1,3-propanediCarbon.itrile.	.....	111001	Isocyanate	Activated Carbon.
Poly (imino imidocarbonyliminoimidocarbonyliminohexamethylene).	.....	111801	Polymer	Activated Carbon.
Imazalil	.....	111901	Aryl Halide	Activated Carbon.
Bromadiolone	.....	112001	Coumarin	Activated Carbon.
Brodifacoum	.....	112701	Coumarin	Activated Carbon.
Bromethalin (ANSI)	.....	112802	Aryl Amine	Activated Carbon.
Fluridone (ANSI)	.....	112900	Aryl Halide	Activated Carbon.
Vinclozolin	.....	113201	Aryl Halide	Activated Carbon.
Metalaxyl	.....	113501	Benzeneamine	Activated Carbon.
Propetamphos (ANSI)	.....	113601	Phosphoroamidothioate	Activated Carbon.
Methyl-1-naphthyl)maleimide	.....	113701	Phthalamide	Activated Carbon.
Hexadecadien-1-yl acetate	.....	114101	Ester	Activated Carbon.
Hexadecadien-1-yl acetate	.....	114102	Ester	Activated Carbon.
Epoxy-2-methyloctadecane	.....	114301	Heterocyclic	Activated Carbon.
Thiodicarb (ANSI)	.....	114501	Thiocarbamate	Activated Carbon.
Dimethyloxazolidine (8CA & 9CA)	.....	114801	Heterocyclic	Activated Carbon.
Trimethyloxazolidine	.....	114802	Heterocyclic	Activated Carbon.
Hydroxyphenyl)oxoacetohydroximic chloride	.....	114901	Phenol	Activated Carbon.
EEEBC	.....	115001	Carbamate	Activated Carbon.
MDM Hydantoin	.....	115501	Hydrazide	Activated Carbon.
DMDM Hydantoin	.....	115502	Hydrazide	Activated Carbon.
Triclopyr (ANSI)	.....	116001	Pyridine	Activated Carbon.
Triethylamine triclopyr	.....	116002	Pyridine	Activated Carbon.
Butoxyethyl triclopyr	.....	116004	Pyridine	Activated Carbon.
Decenyl)dihydro-2(3H)-furanone	.....	116501	Ester	Activated Carbon.
Cytokinins	.....	116801	Toluidine	Activated Carbon.
Benzyladenine	.....	116901	Pyrimidine	Activated Carbon.
Clopyralid, monoethanolamine salt	.....	117401	Pyridine	Activated Carbon.
Clopyralid (ANSI)	.....	117403	Pyridine	Activated Carbon.
Flucythrinate (ANSI)	.....	118301	Pyrethrin	Activated Carbon.
Hydramethylnon (ANSI)	.....	118401	Iminimide	Activated Carbon.
Chlorsulfuron	.....	118601	s-Triazine	Activated Carbon.
Dimethipin	.....	118901	Heterocyclic	Activated Carbon.
Hexadecenal	.....	120001	Miscellaneous Organic	Activated Carbon.
Tetradecenal	.....	120002	Miscellaneous Organic	Activated Carbon.
Thidiazuron	.....	120301	Urea	Activated Carbon.
Metronidazole	.....	120401	Hydrazide	Activated Carbon.
Erythrosine B	.....	120901	Tricyclic	Activated Carbon.
Sethoxydim	.....	121001	Cyclic Ketone	Activated Carbon.
Clethodim	.....	121011	Heterocyclic	Activated Carbon.
Cyromazine	.....	121301	s-Triazine	Activated Carbon.
Tralomethrin	.....	121501	Pyrethrin	Activated Carbon.
Azadirachtin	.....	121701	Tricyclic	Activated Carbon.
Tridecen-1-yl acetate	.....	121901	Ester	Activated Carbon.
Tridecen-1-yl acetate	.....	121902	Ester	Activated Carbon.
Sulfometuron methyl	.....	122001	Pyrimidine	Activated Carbon.
Metsulfuron-methyl	.....	122010	s-Triazine	Activated Carbon.
Propiconazole	.....	122101	Aryl Halide	Activated Carbon.
Furanone, dihydro-5-pentyl	.....	122301	Cyclic Ketone	Activated Carbon.
Furanone, 5-heptyldihydro-	.....	122302	Cyclic Ketone	Activated Carbon.
Abamectin (ANSI)	.....	122804	Tricyclic	Activated Carbon.
Fluazifop-butyl	.....	122805	Pyridine	Activated Carbon.
Fluazifop-R-butyl	.....	122809	Pyridine	Activated Carbon.
Flumetralin	.....	123001	Nitrobenzoate	Activated Carbon.
Fosetyl-Al	.....	123301	Phosphate	Activated Carbon.
Methanol, (((2-(dihydro-5-methyl-3(2H)-oxazolyl)-1-methyl)et.	.....	123702	Heterocyclic	Activated Carbon.
Fomesafen	.....	123802	Nitrobenzoate	Activated Carbon.
Tridiphane	.....	123901	Aryl Halide	Activated Carbon.
POE isooctadecanol	.....	124601	Alcohol	Activated Carbon.
Periplanone B	.....	124801	Bicyclic	Activated Carbon.
Fenoxycarb	.....	125301	Carbamate	Activated Carbon.
Clomazone	.....	125401	Aryl Halide	Activated Carbon.

TABLE 10 TO PART 455.—LIST OF APPROPRIATE POLLUTION CONTROL TECHNOLOGIES [1]—Continued

PAI name [2]	PAI code [3]	Shaughnessy code [4]	Structural group [5]	Treatment technology
Clofentezine	.....	125501	Aryl Halide	Activated Carbon.
Paclobutrazol	.....	125601	Hydrazide	Activated Carbon.
Flurprimidol	.....	125701	Pyrimidine	Activated Carbon.
Isoxaben	.....	125851	Heterocyclic	Activated Carbon.
Isazofos	.....	126901	Phosphorothioate	Activated Carbon.
Triadimenol	.....	127201	Hydrazide	Activated Carbon.
Fenpropathrin	.....	127901	Pyrethrin	Activated Carbon.
Sulfosate	.....	128501	Phosphorothioate	Activated Carbon.
Fenoxaprop-ethyl	.....	128701	Heterocyclic	Activated Carbon.
Quizalofop-ethyl	.....	128711	Phthalimide	Activated Carbon.
Bensulfuron-methyl	.....	128820	Pyrimidine	Activated Carbon.
Imazapyr	.....	128821	Hydrazide	Activated Carbon.
Bifenthrin	.....	128825	Pyrethrin	Activated Carbon.
Imazapyr, isopropylamine salt	.....	128829	Hydrazide	Activated Carbon.
Sodium salt of 1-carboxymethyl-3,5,7-triaza-1-azoniatricyclo.	.....	128832	s-Triazine	Activated Carbon.
Linalool	.....	128838	Alcohol	Activated Carbon.
Imazaquin, monoammonium salt	.....	128840	Pyrimidine	Activated Carbon.
Imazethabenz	.....	128842	Pyrimidine	Activated Carbon.
Thifensulfuron methyl	.....	128845	s-Triazine	Activated Carbon.
Imazaquin	.....	128848	Pyrimidine	Activated Carbon.
Myclobutanil (ANSI)	.....	128857	s-Triazine	Activated Carbon.
Zinc borate (3ZnO, 2B03, 3.5H2O; mw 434.66).	.....	128859	Metallic	Precipitation.
Cyhalothrin	.....	128867	Pyrethrin	Activated Carbon.
Potassium cresylate	.....	128870	Phenol	Activated Carbon.
Triflumizole	.....	128879	Toluidine	Activated Carbon.
Tribenuron methyl	.....	128887	s-Triazine	Activated Carbon.
Cyhalothrin	.....	128897	Pyrethrin	Activated Carbon.
Chlorimuron-ethyl	.....	128901	Pyrimidine	Activated Carbon.
Dodecen-1-yl acetate	.....	128906	Ester	Activated Carbon.
Dodecen-1-yl acetate	.....	128907	Ester	Activated Carbon.
DDOL	.....	128908	Alcohol	Activated Carbon.
Farnesol	.....	128910	Alcohol	Activated Carbon.
Nerolidol	.....	128911	Alcohol	Activated Carbon.
Tefluthrin	.....	128912	Pyrethrin	Activated Carbon.
Bromoxynil heptanoate	.....	128920	Chloropropionanilide	Activated Carbon.
Imazethapyr	.....	128922	Pyrimidine	Activated Carbon.
Imazethapyr, ammonium salt	.....	128923	Pyrimidine	Activated Carbon.
Chitosan	.....	128930	Polymer	Activated Carbon.
Sulfuric acid, monourea adduct	.....	128961	Urea	Activated Carbon.
Hydroprene	.....	128966	Miscellaneous Organic	Activated Carbon.
Triasulfuron	.....	128969	Urea	Activated Carbon.
Primisulfuron-methyl	.....	128973	Urea	Activated Carbon.
Uniconazole (ANSI)	.....	128976	s-Triazine	Activated Carbon.
Tetradecenyl acetate	.....	128980	Miscellaneous Organic	Activated Carbon.
Chitin	.....	128991	Polymer	Activated Carbon.
Sulfluramid	.....	128992	Sulfonamide	Activated Carbon.
Dithiopyr (ANSI)	.....	128994	Pyridine	Activated Carbon.
Nicosulfuron	.....	129008	Pyrimidine	Activated Carbon.
Zinc	.....	129015	Metallic	Precipitation.
Tetradecen-1-ol, acetate, (E)-	.....	129019	Alkyl Acid	Activated Carbon.
Imazaquin, sodium salt	.....	129023	Pyrimidine	Activated Carbon.
Dodecadien-1-ol	.....	129028	Alcohol	Activated Carbon.
Ionone	.....	129030	Miscellaneous Organic	Activated Carbon.
Dicamba, aluminum salt	.....	129042	Aryl Halide	Activated Carbon.
Benzenemethanaminium, N-(2-((2,6-dimethylphenyl)amino)-2-oxo.	.....	129045	NR4	Activated Carbon.
Fenoxaprop-p-Ethyl	.....	129092	Tricyclic	Activated Carbon.
Alkyl* bis(2-hydroxyethyl) ammonium acetate *(as in fatty ac.	.....	169103	NR4	Activated Carbon.
Alkenyl* dimethyl ammonium acetate *(75% C18', 25% C16').	.....	169104	NR4	Activated Carbon.
Amines, N-coco alkyltrimethylenedi-, adipates.	.....	169109	Iminamide	Activated Carbon.
Dialkyl* dimethyl ammonium bentonite *(as in fatty acids of.	.....	169111	NR4	Activated Carbon.
Alkyl* bis(2-hydroxyethyl) amine acetate *(65% C18, 30% C16,.	.....	169125	Acetamide	Activated Carbon.
Dodecyl bis(hydroxy ethyl) dioctyl ammonium phosphate.	.....	169154	NR4	Activated Carbon.

TABLE 10 TO PART 455.—LIST OF APPROPRIATE POLLUTION CONTROL TECHNOLOGIES [1]—Continued

PAI name [2]	PAI code [3]	Shaughnessy code [4]	Structural group [5]	Treatment technology
Dodecyl bis(2-hydroxyethyl) octyl hydrogen ammonium phosphat.	.....	169155	NR4	Activated Carbon.
Didecyl-N-methyl-3-(trimethoxysilyl)propanaminium chloride.	.....	169160	NR4	Activated Carbon.
Cholecalciferol	.....	202901	Bicyclic	Activated Carbon.
Use code no. 202901 (Vitamin D3)	.....	208700	Bicyclic	Activated Carbon.
Alkyl* N,N-bis(2-hydroxyethyl)amine *(100% C8–C18).	.....	210900	NR4	Activated Carbon.
Bromo-2-nitropropane-1,3-diol	.....	216400	Alcohol	Activated Carbon.
Use code no. 114601 (cyclohexyl-4, 5-dichloro- 4-isothioazolin-3-one).	.....	229300	Heterocyclic	Activated Carbon.
Diethatyl ethyl	.....	279500	Toluidine	Activated Carbon.
Hydroprene (ANSI)	.....	486300	Miscellaneous Organic	Activated Carbon.
Zinc sulfate monohydrate	.....	527200	Metallic	Precipitation
Geraniol	.....	597501	Alcohol	Activated Carbon.

[1] The 272 Pesticide Active Ingredients (PAIs) are listed first, by PAI code, followed by the non-272 PAIs from the 1988 FIFRA and TSCA Enforcement System (FATES) Database, which are listed in Shaughnessy code order. PAIs that were exempted or reserved from the PFPR effluent guidelines are not listed in the table.

[2] The non-272 PAI names are taken directly from the 1988 FATES database. Several of the PAI names are truncated because the PAI names listed in the FATES database are limited to 60 characters.

[3] The non-272 PAIs do not have PAI codes.

[4] All Shaughnessy codes are taken from the 1988 FATES database. Some of the 272 PAIs are not listed in the 1988 FATES database; therefore, no Shaughnessy codes are listed for these PAIs.

[5] Structural groups are based on an analysis of the chemical structures of each PAI.

[6] EPA has also received data indicating that acid hydrolysis may also be effective in treating this PAI.

* This PAI code represents a category or group of PAIs; therefore, it has multiple Shaughnessy codes.

[FR Doc. 96–25771 Filed 11–5–96; 8:45 am]

BILLING CODE 6560–50–P