

WISCONSIN LEGISLATIVE COUNCIL STAFF

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FORM 2

RULES CLEARINGHOUSE

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CLEARINGHOUSE REPORT TO AGENCY

[THIS REPORT HAS BEEN PREPARED PURSUANT TO S. 227.15, STATS. THIS IS A REPORT ON A RULE AS ORIGINALLY PROPOSED BY THE AGENCY; THE REPORT MAY NOT REFLECT THE FINAL CONTENT OF THE RULE IN FINAL DRAFT FORM AS IT WILL BE SUBMITTED TO THE LEGISLATURE. THIS REPORT CONSTITUTES A REVIEW OF, BUT NOT APPROVAL OR DISAPPROVAL OF, THE SUBSTANTIVE CONTENT AND TECHNICAL ACCURACY OF THE RULE.]

CLEARINGHOUSE RULE 98-198

AN ORDER to amend NR 233.03 (3) and 233.04 (3); to repeal and recreate NR 233.30 and 233.31; and to create NR 233.03 (1e), (1o), (2e), (2o), (2p), (2q), (2u), (3e), (6e), (6o), (7e), (7o), (7s) and (7u), 233.04 (3e), subchapter IV (title) of chapter NR 233, NR 233.305, 233.32 to 233.36 and subchapter VI of chapter NR 233, relating to the regulation of effluent limitations and pretreatment standards for the pesticide chemicals industry.

Submitted by **DEPARTMENT OF NATURAL RESOURCES**

12-10-98 RECEIVED BY LEGISLATIVE COUNCIL.
01-13-99 REPORT SENT TO AGENCY.

RNS:DLL:kjf:jt

LEGISLATIVE COUNCIL RULES CLEARINGHOUSE REPORT

This rule has been reviewed by the Rules Clearinghouse. Based on that review, comments are reported as noted below:

1. STATUTORY AUTHORITY [s. 227.15 (2) (a)]

Comment Attached YES NO

2. FORM, STYLE AND PLACEMENT IN ADMINISTRATIVE CODE [s. 227.15 (2) (c)]

Comment Attached YES NO

3. CONFLICT WITH OR DUPLICATION OF EXISTING RULES [s. 227.15 (2) (d)]

Comment Attached YES NO

4. ADEQUACY OF REFERENCES TO RELATED STATUTES, RULES AND FORMS
[s. 227.15 (2) (e)]

Comment Attached YES NO

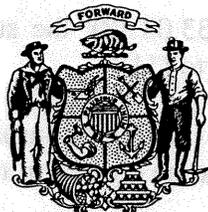
5. CLARITY GRAMMAR PUNCTUATION AND USE OF PLAIN LANGUAGE [s. 227.15 (2) (f)]

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CLEARINGHOUSE RULE 98-198

Comments

[NOTE: All citations to "Manual" in the comments below are to the Administrative Rules Procedures Manual, prepared by the Revisor of Statutes Bureau and the Legislative Council Staff, dated September 1998.]

2. Form, Style and Placement in Administrative Code

a. The rule lacks an introductory clause in the format set forth in s. 1.02 (1), Manual. The clause should show how the various rule provisions are affected by the proposed rule.

b. In s. NR 233.03 (1e), the material following "Table 10" should be omitted.

c. In s. NR 233.03 (1o), the definition of "equivalent system" is primarily substantive material which should be placed in the text of the rule, rather than in a definition. [See s. 1.01 (7), Manual.]

d. To distinguish between sections of the administrative code and SECTIONS of a rule-making order, when referring to a SECTION of a rule-making order, the word "SECTION" is written in capital letters. [See s. 1.04 (1), Manual.]

e. In s. NR 233.03 (2o) (intro.), the word "pesticide" should be omitted, since the term "active ingredient" is defined. The entire rule should be reviewed for the consistent use of this defined term.

f. Many of the definitions created in this rule contain substance, which should be placed in the text of the rule, rather than in definitions. [See s. 1.01 (7), Manual.] In many cases, the substance appears to be getting at matters of applicability. In these cases, the definitions should be limited simply to stating what the term means and the information regarding applicability

should be placed in appropriate applicability provisions. See, for example, ss. NR 233.03 (6e) and (7u), 233.305 (6) and 233.51.

g. Since there is no s. NR 233.03 (8), the subsections created by SECTIONS 13 to 17 should be numbered s. NR 233.03 (8) to (11).

h. Since s. NR 233.03 (3) creates separate definitions applicable to different subchapters, separate definitions should be created in those individual subchapters.

i. The term "agricultural pesticide," used in s. NR 233.30 (2) is undefined. What pesticides are agricultural pesticides?

j. In s. NR 233.30 (4) (intro.), "any of the following" should be inserted before the colon. [See s. 1.03 (8), Manual.] The entire rule should be reviewed for instances of this error.

k. The phrase "as defined in s. _____" should never be used when the applicability of the defined term is set forth in a definitions section. See, for example, s. NR 233.30 (4) (d) and 233.31 (2).

l. Although it is drafted as definitions, virtually all of s. NR 233.305 is substantive requirements. These provisions should either be redrafted as free-standing requirements or incorporated into the following sections. This should not cause undue repetition of text, since as subsequent comments suggest, the following sections should be collapsed into a single section themselves.

m. If the department chooses to retain s. NR 233.305 in the form of definitions, the following corrections should be made to the format:

(1) The title should simply be "**Definitions**" and an introductory phrase "In this subchapter:" should be added.

(2) Section NR 233.305 (3) (c) should be rewritten to follow grammatically from s. NR 233.305 (3) (intro.). This problem stems from the underlying problem that these are substantive requirements, rather than definitions.

(3) The word "of" should be replaced by the word "or" in the phrase "quantity of concentrations" in s. NR 233.305 (4) (b).

(4) The definition of "process wastewater" should be preceded by the phrase "notwithstanding s. NR 205.03 (30)." However, as noted earlier, the substance of this provision should be dealt with in an applicability provision.

n. Sections NR 233.31 to 233.36 need considerable rewriting:

(1) Since these provisions are virtually identical, much repetition of language could be avoided by collapsing them into a single section.

- (2) The drafting is wordy and confusing. It never comes out and states in so many words that, for example, the effluent limitation representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (the BPT effluent limitation) is zero discharge. Section NR 233.31 (intro.) and (1) (a) could be collapsed into a single sentence stating: "Any existing point source subject to this subchapter may not discharge process wastewater pollutants to navigable waters." Or ". . . is subject to an effluent limitation of zero discharge of process wastewater pollutants to navigable waters." If the department feels that it is necessary to repeat the federal language describing the BPT limits, it should at least ensure that the rule makes a clear statement that the BPT limit is zero discharge. These comments apply to the following sections, as well.
- (3) Section NR 233.31 (1) (b), and the parallel provisions in the subsequent sections, should be rewritten as a requirement, rather than as a definition. It could read, for example: "A permitting authority shall not provide additional discharge allowances in pesticide formulating, packaging and repackaging wastewater discharge limits for active ingredients that are also manufactured at the facility." Also, is the phrase "which are also subject to ss. NR 233.12 or 233.22" a qualification of the applicability of that provision or a comment? If it is a qualification, the word "which" should be replaced by the word "that"; if it is a comment, it should be placed in a note.
- (4) Can the cross-reference to 40 CFR 125.30 to 125.32 be replaced by references to Wisconsin rules? This exception is particularly troubling since it appears to depend upon determinations made by the U.S. Environmental Protection Agency. Are similar determinations made by the department, or could they be made by the department? The effect of this exception is not entirely clear.
- (5) It appears that s. NR 233.31 (2), and the parallel provisions of the following sections, is where the material contained in s. NR 233.305 should be incorporated. In the introduction of this subsection, the cross-reference appears to be incorrect.
- (6) What is a "modification by best professional judgment" referred to in s. NR 233.31 (2) (a) and parallel subsequent provisions? How does one obtain such a modification? This should be spelled out in the rule or identified by a cross-reference to a rule provision that spells it out.
- (7) What is a WPDES permit writer, referred to in s. NR 233.31 (2) (b) and subsequent parallel provisions, and how does it differ from the defined term of "permitting authority"?
- (8) Section NR 233.33 (intro.) is improperly drafted as introductory material. [See s. 1.03 (8), Manual.] It should end in a colon and lead into the

subsections that follow. In the alternative, it could be numbered sub. (1) and the other subsections could be numbered subs. (2) and (3).

(9) In s. NR 233.33 (2) (b), “shall” should replace “will.”

o. Sections NR 233.52 to 233.57 suffer from some of the same defects as those in ss. NR 233.31 to 233.36.

p. There are no treatment clauses for the sections creating Tables 8 to 10. Also, is the table starting on p. 31 of the order a continuation of Table 10? If so, this should be made clearer.

q. The rule does not have an effective date clause. [See s. 1.02 (4), Manual.]

4. Adequacy of References to Related Statutes, Rules and Forms

a. In s. NR 233.36 (1), “sub. (2)” should replace “sub. 2”.

b. In s. NR 233.36 (2) (c), “(3)” should replace “(2)”.

5. Clarity, Grammar, Punctuation and Use of Plain Language

a. In s. NR 233.03 (2e), the definition of “formulation of pesticide products” might be clearer if the phrase “without an intended chemical reaction” were set off by commas.

b. The choice of terms that are defined are sometimes counterintuitive or otherwise inappropriate. For example, the definition of “interior wastewater sources” in s. NR 233.03 (2r) refers to specific types of water, not sources of water; the defined term should be “interior wastewater.” The definition of the term “microorganisms” in sub. (2u) refers only to microorganisms that have been registered as pesticides; the defined term should be “microbial pesticide.” The definition of the term “PFPR/manufacturer” in sub. (6e) refers to specific facilities, not manufacturers; the defined term should be “PFPR manufacturing facility.”

c. The references to eucaryotes and procaryotes in s. NR 233.03 (2u) appear unnecessary and potentially incorrect under modern biological theory. That definition could end with the phrase “. . . protozoa, algae, fungi, bacteria and viruses.”

d. Section NR 233.03 (6o) should be rewritten as follows: ““Pool chemical” means a pesticide that is intended to disinfect or sanitize swimming pools, hot tubs, spas or other similar areas in a household or institutional environment or to reduce or mitigate the growth or development of microbial organisms, such as bacteria, algae, fungi or viruses.” Also, should this list of examples include protozoa, as in the definition of “microorganisms”?

e. Something appears to be wrong with the second sentence in s. NR 233.03 (7s), since it refers to surfaces with labeled directions for use. Also, the last sentence of that subsection includes the phrase “exempted by s. NR 233.03 (6o), although the cross-referenced definition does not exempt or exclude anything. The notation “(7) (s)” should be replaced by the notation

“(7s)” unless the earlier recommendation regarding the numbering of this definition is adopted. Also, why is “otherwise” in this sentence?

f. Section NR 233.30 (3) (f) should be rewritten as follows: “On-site laboratories from cleaning analytical equipment and glassware and from rinsing the retain sample container, except that this subchapter applies to the initial rinse of the retain sample container. These changes correct punctuation, avoid a double negative and spell out the word “subchapter.”

g. The last sentence of s. NR 233.30 (6) is confusing. First, what does “subordinate disinfectant claims” mean? Does this refer to any product which is claimed to have subordinate disinfectant qualities? Second, what does “includes” mean? Does it mean that sterilants and the other category of products are included in the applicability of this subchapter or included in the exclusion from that subchapter created by sub. (6)?

h. There is a stray occurrence of the word “discharge” in s. NR 233.32 (1) (b), which should be deleted.

ORDER OF THE STATE OF WISCONSIN NATURAL RESOURCES BOARD AMENDING RULES

The Wisconsin Natural Resources Board proposes an order to amend NR 233 relating to the regulation of effluent limitations and pretreatment standards for the pesticide chemicals industry.

Backs intro. clause
see s. 1.02 (1)
Manual



Analysis prepared by the Department of Natural resources

Statutory authority: ss: 283.11(1), 283.19(1), 283.21(1), and 227.11(2)(a), Stats.

Statutes interpreted: ss: 283.11, 283.13, 283.19, and 283.21, Stats.

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." (33 USC s. 1251(a)). To implement the act, the U.S. Environmental Protection Agency issues effluent limitation guidelines, pretreatment standards, and new source performance standards for industrial wastewater discharges. The Clean Water Act of 1977 expanded the federal pollution control program by setting different types of effluent limitations: "best practicable technology" (BPT), "best available technology" (BAT), "best conventional technology" (BCT), "new source performance standards" (NSPS), "pretreatment standards for existing sources" (PSES), and "pretreatment standards for new sources" (PSNS). The Clean Water Act stresses control of toxic pollutants, including 65 "priority" pollutants and classes of pollutants in 21 major industries.

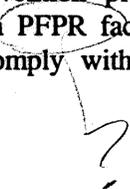
The Wisconsin Department of Natural Resources instituted the Wisconsin pollutant discharge elimination system in 1976. This system included regulation of effluent discharges from various industries. The Wisconsin Department of Natural Resources is amending ch. NR 233, Wis. Adm. Code, to regulate the pesticide chemicals industry. The provisions of this chapter are based upon the U.S. Environmental Agency's regulations in 40 CFR part 455.

The purpose of these amendments is to specify effluent limitations for BPT, BCT, BAT, and NSPS for the direct discharge of pollutants to waters of the state and to establish pretreatment standards for the introduction of pollutants into publicly owned treatment works. The effect of amending ch. NR 233, Wis. Adm. Code will be to establish state standards and limitations for industrial wastewater discharges from the formulating, packaging, and repackaging sectors of the pesticide chemical industry. The Code will reflect these changes made by the United States Environmental Protection Agency under authority of sections 301,304, 306, 307, 308 and 501 of the Clean Water Act. (33 USC ss. 1311, 1314, 1316, 1318, and 1361).

For facilities that formulate, package, or repackage pesticides, this proposed rule establishes 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 pesticide active ingredients and priority pollutants after various pollution prevention practices are followed and treatment is conducted as needed. Each owner or operator of a PFPR facility shall make an initial choice of whether the facility will meet zero discharge or comply with the pollution prevention

(PFPR)

5



alternative. This choice can be made on a product family, process line, or process unit basis rather than a facility-wide basis. If the zero discharge option is chosen, then the facility owner or operator will need to do whatever is necessary to eliminate the discharge. If the pollution prevention alternative portion of the option is chosen, the owner or operator of the facility must agree to comply with the pollution prevention practices identified in Table 8 of this proposed rule.

This proposed rule also establishes a zero discharge limitation and pretreatment standard for agricultural pesticide refilling establishments. This limitation is based on collection and storage of process wastewaters, including rinsates from cleaning minibulk containers and ancillary equipment as well as 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.

The federal document forming the basis for 40 C.F.R. Part 455 and ch. NR 233 is the "Development Document for Best Available Technology, Pretreatment Technology, and New Source Performance Technology for the Pesticide Formulating, Packaging, and Repackaging Industry-Final" (USEPA, Washington D.C., EPA-821-R-96-019, November 1996). A copy of this document is available for inspection at the central office of the Wisconsin Department of Natural Resources, 101 South Webster Street, Madison, WI, and may be obtained from the National Technical Information Service (NTIS), Springfield, Virginia 22161, (703) 487-4600.

This proposed rule is essentially identical to 40 C.F.R. Part 455 for purposes of s. 227.14(1m)(a), Stats. However, changes have been made in the text of the federal regulation to make the rule useful to Wisconsin citizens, industry, and regulating authorities. These changes are consistent with the current state regulatory framework and reflect the conventions of state rule drafting.

Where possible, Wisconsin Administrative Code references were substituted in the text for reference to the Code of Federal Regulations.

6

format

Section 1. NR 233.03(1e) is created to read:

NR 233.03(1e) "Appropriate pollution control technology" means the wastewater treatment technology listed in Table 10 for a particular pesticide active ingredient including an emulsion breaking step prior to the listed technology when emulsions are present in the wastewater to be treated.

substance who judges what meets de f. ?

Section 2. NR 233.03(1o) is created to read:

NR 233.03(1o) "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 or priority pollutant as the applicable appropriate pollution control technology listed in Table 10.

ditto

Section 3. NR 233.03(2e) is created to read:

NR 233.03(2e) "Formulation of pesticide products" means the process of mixing, blending, or diluting one or more of the pesticide active ingredients with one or more active or inert ingredients, without an intended chemical reaction, to obtain a manufacturing use product or an end use product.

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Section 4. NR 233.03(2o) is created to read:

NR 233.03(2o) "Group one mixtures" means any product whose only pesticide active ingredient is:

1. Any common food or food constituent.
2. Any non-toxic household item.
3. Any substance that is generally recognized as safe by the u.s. food and drug administration as provided in 21 CFR 170.30, Parts 182, 184, and 186 in accordance with good manufacturing practices as defined by 21 CFR Part 182.
4. Any product exempt from the federal insecticide fungicide rodenticide act as provided in 40 CFR 152.25.

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Section 5. NR 233.03(2p) is created to read:

NR 233.03(2p) "Group 2 mixtures" means those chemicals listed in Table 9.

Section 6. NR 233.03(2q) is created to read:

NR 233.03(2q) "Inorganic wastewater treatment chemicals" means inorganic chemicals that are commonly used in wastewater treatment systems to aid in the removal of pollutants through physical and chemical technologies such as chemical precipitation, flocculation, neutralization, chemical oxidation, hydrolysis, or adsorption

Section 7. NR 233.03(2r) is created to read:

NR 233.03(2r) "Interior wastewater sources" means any cooling water that comes into direct contact with pesticide active ingredients during the formulating, packaging, or repackaging process. Also included is wastewater that is generated from cleansing or rinsing the interior of:

1. Any pesticide formulating, packaging, or repackaging equipment.
2. Any raw material drums, shipping containers, and bulk storage tanks.

Section 8. NR 233.03(2u) is created to read:

NR 233.03(2u) "Microorganisms" means registered pesticide active ingredients that are biological control agents listed in 40 CFR 152.20(a)(3) including eucaryotes such as protozoa, algae, fungi or procaryotes such as bacteria and viruses.

Section 9. NR 233.03(3) is amended to read:

NR 233.03(3) "New source" means any point source for which the commencement of construction occurred after April 10, 1992, in subchs. II and III and after April 14, 1994 for subchs. IV and VI and from which pollutants are or may be discharged either to waters of the state or into a publicly owned treatment works.

Section 10. NR 233.03 (3e) is created to read:

NR 233.03(3e) "Packaging of pesticide products" means enclosing or placing a formulated pesticide product into a marketable container.

Section 11. NR 233.03(6e) is created to read:

NR 233.03(6e) "PFPR/manufacturing" means a pesticide formulating, packaging, or repackaging facility that also performs pesticide manufacturing on-site and commingles their PFPR process wastewaters and pesticide manufacturing process wastewaters.

Section 12. NR 233.03(6o) is created to read:

^{or to} ^{flu}
NR 233.03(6o) "Pool chemicals" means pesticide products that are intended to disinfect or sanitize, reduce or mitigate growth or development of microbiological organisms. These organisms include bacteria, algae, fungi, or viruses in the water of swimming pools, hot tubs, spas, or other such areas in the household or institutional environment as provided in the directions for use on the product label.

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⁸
Section 13. NR 233.03(7e) is created to read:

NR 233.03(7e) "Refilling establishment" means an establishment where the activity of repackaging a pesticide product occurs.

⁹
Section 14. NR 233.03(7o) is created to read:

NR 233.03(7o) "Repackaging of pesticide products" means the transfer of a pesticide formulation or pesticide active ingredients from one container to another without a change in composition of the formulation or the labeling content for sale or distribution.

¹⁰
Section 15. NR 233.03(7s) is created to read:

NR 233.03(7s) "Sanitizer products" means pesticide products that are intended to disinfect or sanitize, reduce or mitigate growth or development of microbiological organisms including bacteria, fungi, or viruses on inanimate surfaces. Surfaces include those in the household, institutional, or commercial environments and whose labeled directions for use result in the product being discharged to a POTW. This definition also includes sanitizer solutions as defined by 21 CFR 178.1010 and pool chemicals as defined in this section. This definition does not include liquid chemical sterilants, including sporicidals, exempted by s. NR 233.03 (6o) or otherwise industrial preservatives and water treatment microbiocides other than pool chemicals.

no connection!

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¹¹
Section 16. NR 233.03(7u) is created to read:

NR 233.03(7u) "Stand-alone PFPR facility" means a PFPR facility where either no pesticide manufacturing occurs or pesticide manufacturing process wastewaters are not commingled with PFPR process wastewaters. Such facilities may formulate, package, repackage, or manufacture other non-pesticide chemical products and be considered a stand-alone PFPR facility.

Doesn't exempt, or even exclude, anything

Substance ✓

is this what the def. is getting at?

9

Section 17. NR 233.04(3) is amended to read:

NR 233.04(3) Any existing source subject to ~~this chapter~~, subchs. II and III which introduces process wastewater pollutants into a POTW shall achieve PSES by September 28, 1996

Section 18. NR 233.04(3e) is created to read:

NR 233.04(3e) Any existing source subject to subchs. IV and VI which introduces process wastewater pollutants into a POTW shall achieve PSES by November 6, 1999.

Section 19. Chapter NR 233 Subchapter IV (title) is amended to read:

Subchapter IV Pesticide ~~Chemicals~~ Formulating and, Packaging and Repackaging Subcategory

Section 20. NR 233.30 is repealed and recreated to read:

NR 233.30 (title) **Applicability; description of the pesticide formulating, packaging and repackaging subcategory.** (1) This subchapter is applicable to discharges resulting from all pesticide formulating, packaging, and repackaging operations except as provided in subs. (2) to (6).

(2) This subchapter does not apply to repackaging of agricultural pesticides performed at refilling establishments as described in s. NR 233.50. *undetermined*

(3) This subchapter does not apply to wastewater discharges from:

- (a) The operation of employe showers and laundry facilities.
- (b) The testing of fire protection equipment.
- (c) The testing and emergency operation of safety showers and eye washes.
- (d) Storm water.

(e) Department of transportation aerosol leak test baths or batch baths where no cans have burst from the time of the last water change-out.

(f) On-site laboratories from cleaning analytical equipment, ^{and} glassware, ^{from} and rinsing the retain sample container, except for ~~the initial rinse of the retain sample container which is considered a process wastewater for this subch.~~ *that this subchapter applies to Cabot double reg.*

(4) This subchapter does not apply to wastewater discharges from the formulation, packaging, or repackaging of: *any...*

- (a) Any sanitizer product including pool chemicals.
- (b) Any microorganism.
- (c) Any inorganic wastewater treatment chemical

(d) Any group one ~~and~~ group 2 mixture as defined under s. NR 233.03 (20) and s. NR 233.03(2p). *or*

(5) This subchapter does not apply to wastewater discharges from the development of new formulations of pesticide products and the associated efficacy and field testing at on-site and

stand-alone research and development laboratories where the resulting pesticide product is not produced for sale.

(6) This subchapter does not apply to wastewater discharges from the formulation, packaging, or repackaging of liquid chemical sterilant products for use on a critical or semi-critical device as defined in s. 201 of the federal food, drug, and cosmetic act and in s. 2(u) of the federal insecticide, fungicide, rodenticide act. This includes any sterilant or subordinate disinfectant claims on the products.

(5) ✓

≠ sterilant

Section 21. NR 233.305 is created to read:

In this subchapter:

NR 233.305 ~~Special~~ definitions. (1) "Initial certification statement" means a written submission to the appropriate permitting authority which shall be signed by the responsible corporate officer as defined in s. NR 211.15 (10) and which:

↓
all
subs from
(2) ✓

(a) Lists and describes those product families, process lines, or process units for which the PFPR facility is implementing the pollution prevention alternative.

(b) Describes the PFPR facility specific practices for each product family, process line, or process unit which are to be practiced as part of the pollution prevention alternative.

(c) Describes any justification allowing modification to the practices listed in Table 8 to this chapter.

(d) Lists the treatment system being used to obtain a pollution prevention alternative discharge as defined in this section.

(2) "On-site compliance paperwork" means data or information maintained in the offices of the PFPR facility which supports the initial and periodic certification statements as follows:

(a) Lists and describes those product families, process lines, or process units for which the facility is implementing the pollution prevention alternative.

(b) Describes the facility specific practices for each product family, process line, or process unit which are to be practiced as part of the pollution prevention alternative.

(c) Describes any justification allowing modification to the practices listed in Table 8 of this subchapter.

(d) Includes a written discussion demonstrating that the treatment system being used contains the appropriate pollution control technologies or equivalent systems for removing the pesticide active ingredients which may be found in the wastewater.

(e) Establishes a method for demonstrating to the permitting or control authority that the treatment system is well operated and maintained.

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

(3) "Periodic certification statement" means a written submission to the appropriate permitting authority which states that the pollution prevention alternative is being implemented in the following manner:

(a) In the control mechanism for indirect dischargers

(b) In the WPDES permit for direct dischargers.

(c) A justification allowing modification of the practices listed in Table 8 to this chapter implemented resulting in a change in the pollution prevention practices conducted at the facility.

The periodic certification statement shall be signed by the responsible corporate officer as defined in s. NR 211.15 (10).

(4)(a) "Pollution prevention allowable discharge for indirect dischargers excluding interior

does not follow from intro.

||

19-word term
35-word definition

wastewater sources, leak and spill clean-up water, and floor wash" means the quantity or 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.

(b) "Pollution prevention allowable discharge for indirect dischargers including interior wastewater sources, leak and spill cleanup water, and floor wash" means the quantity of or 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. Additionally the wastewaters shall have been pretreated using appropriate pollution control technologies as defined in s. NR 233.03 (1e), 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 s. NR 211.13, provided the granting of the credits does not result in pass through or interference as defined in s. NR 211.03 and complies with the provisions of s. NR 211.10. The facility shall demonstrate that the appropriate pollution control technology is properly maintained and operated.

also, singular vs. plural

(5) "Pollution prevention allowable discharge for direct dischargers" in this subchapter 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. Additionally the wastewaters shall have been treated using appropriate pollution control technologies, as defined in s. NR 233.03 (1e), 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 shall demonstrate that the appropriate pollution control technology is properly maintained and operated.

✓
s. NR 203.03 (D)

(6) "Process wastewater," 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 s. NR 233.30.

Don't need this; deal w/ it in same for 233.51

incorporate exceptions into WAC
exp. since depend on EPA determinations note?

Section 22. NR 233.31 is repealed and recreated to read:

NR 233.31 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 to 125.32, any existing point source subject to the provisions of this subchapter shall achieve the following effluent limitations representing the

also manufactured at the same facility.

(2) Any existing facility subject to sub. (1) may have a pollution prevention allowable discharge, as defined in s. NR 233.305 (6), of wastewater pollutants to navigable waters if the discharger agrees to WPDES permit conditions as follows:

(a) The discharger shall meet the requirements of the pollution prevention alternative listed in Table 8 to this chapter or receive a modification by best professional judgment for modifications not listed in Table 8.

(b) The discharger shall notify its WPDES 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 WPDES permit writer an initial certification statement as described in s. NR 233.305 (1).

(c) The discharger shall submit to its WPDES permitting authority a periodic certification statements as described in s. NR 233.305 (2) once each year of operation.

(d) The discharger shall maintain at the office of the facility and make available for inspection the on-site compliance paperwork as described in s. NR 233.305 (3).

Section 23. NR 233.32 is created to read:

NR 233.32 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 to 125.32, any existing point source subject to this subchapter shall achieve the effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology.

(1)(a) Except as provided in sub.(2) the BCT limitations are established as follows. There shall be no discharge of process wastewater pollutants to navigable waters.

(b) For existing PFPR/manufacturer facilities, as defined in s. NR 233.03 (6e), which are also subject to s. NR 233.13, "zero discharge" means that permitting authorities shall provide no discharge additional discharge allowance for those pesticide active ingredients in the pesticide formulating, packaging, and repackaging wastewaters when those pesticide active ingredients are also manufactured at the same facility.

(2) Any existing facility subject to sub. (1) may have a pollution prevention allowable discharge, as defined in s. NR 233.305 (5), of wastewater pollutants to navigable waters if the discharger agrees to WPDES permit conditions as follows:

(a) The discharger shall meet the requirements of the pollution prevention alternative listed in Table 8 or receive a modification by best professional judgment for modifications not listed in Table 8.

(b) The discharger shall notify its WPDES 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 WPDES permit writer an initial certification statement as described in s. NR 233.305(1).

(c) The discharger shall submit to its WPDES permitting authority a periodic certification statement as described in s. NR 233.305 (2) once each year of operation.

(d) The discharger shall maintain at the office of the facility and make available for inspection the on-site compliance paperwork as described in s. NR 233.305 (3).

described
wrong x-ref. anyway

what's this? how do you get it?

department?
?

identical to 233.32?

5

41 13

Section 24. NR 233.33 is created to read:

NR 233.33 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 to 125.32, any existing point source subject to this section shall achieve the effluent limitations representing the degree of effluent reduction attainable by the application of the BAT. *identical to 233.31 ?*

(1) Except as provided in sub. (2), the BAT limitations are established as follows: *intra*

(a) There may be no discharge of process wastewater pollutants to navigable waters.

(b) For existing PFPR/manufacturer facilities, as defined in s. NR 233.03 (6e), which are also subject to s. NR 233.14, "zero discharge" means that permitting authorities shall provide no additional discharge allowance for those pesticide active ingredients in the pesticide formulating, packaging and repackaging wastewaters when those pesticide active ingredients are also manufactured at the same facility.

(2) Any existing facility subject to sub. (1) may have a pollution prevention allowable discharge, as defined in s. NR 233.305 (5), of wastewater pollutants to navigable waters if the discharger agrees to WPDES permit conditions as follows:

(a) The discharger shall meet the requirements of the pollution prevention alternative listed in Table 8 or receive a modification by best professional judgment for modifications not listed on Table 8.

(b) The discharger will notify its WPDES 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 s. NR 233.305(1).

(c) The discharger shall submit to its NPDES permit writer a periodic certification statement as described in s. NR 233.305 (2) once each year of operation.

(d) The discharger shall maintain at the office of the facility and make available for inspection the on-site compliance paperwork as described in s. NR 233.305 (3).

Section 25. NR 233.34 is created to read:

NR 233.34 New source performance standards (NSPS). *no*

(1)(a) Any new source, except as provided in sub. (2) subject to this section, which discharges process wastewater shall meet the following standard. There may be no discharge of process wastewater pollutants to navigable waters. *almost identical to 233.31 - no exception*

(b) For new PFPR/manufacturer facilities, as defined in s. NR 233.03 (6e), which are also subject to s. NR 233.15, "zero discharge" means that permitting authorities shall provide no additional discharge allowance for those pesticide active ingredients in the pesticide formulating, packaging and repackaging wastewaters when those pesticide active ingredients are also manufactured at the same facility.

(2) Any new source subject to sub. (1) may have a pollution prevention allowable discharge, as defined in s. NR 233.305 (5), of wastewater pollutants to navigable waters if the discharger agrees to WPDES permit conditions as follows:

(a) The discharger shall meet the requirements of the pollution prevention alternative listed in Table 8 or received a modification by best professional judgment for modifications not listed in Table 8.

(b) The discharger shall notify the department at the time of submitting its application for a permit, of its intent to utilize the pollution prevention alternative by submitting to the WPDES permit writer an initial certification statement as described in s. NR 233.305 (1).

(c) The discharger shall submit a periodic certification statement as described in s. NR 233.305 (2) once each year of operation; and

(d) The discharger shall maintain at the office of the facility and make available for inspection the on-site compliance paperwork as described in s. NR 233.305 (3).

Section 26. NR 233.35 is created to read:

NR 233.35 Pretreatment standards for existing sources (PSES). (1) Except as provided in ss. NR 211.13 and 211.14 or in sub.(2) no later than November 6, 1999, any existing source

Section 27. NR 233.36 is created to read:

NR 233.36 Pretreatment standards for new sources (PSNS). (1) Except as provided in ss. NR 211.13 and 211.14 or in sub. 2 any new source subject to this subchapter which introduces pollutants into a publicly owned treatment works shall comply with ch. NR 211 and achieve PSNS as follows. There may be no discharge of process wastewater pollutants to navigable waters.

(2) Except as provided in ss. NR 211.13 and 211.14, any new source subject to sub.(1) which introduces pollutants into a publicly owned treatment works shall comply with ch. NR 211 and may have a pollution prevention allowable discharge of wastewater pollutants, as defined in s. NR 233.305 if the discharger agrees to control mechanism or pretreatment agreement conditions as follows:

(a) The discharger shall meet the requirements of the pollution prevention alternative listed in Table 8 to this chapter or receive a modification by best engineering judgment for modifications not listed in Table 8.

(b) The discharger shall notify the department 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 s. NR 233.305 (1)

(c) The discharger shall submit to the department a periodic certification statement as described in s. NR 233.305 (2) during the months of June and December of each year of operation.

(d) The discharger shall maintain at the offices of the facility and make available for inspection the on-site compliance paperwork as described in s. NR 233.305 (3).

(3) Except as provided in ss. NR 211.13 and 211.14, any new source subject to sub.(2) which introduces pollutants into a publicly owned treatment works shall comply with ch. NR 211 and may submit a request to the department to waive pretreatment of floor wash or a non-reusable final rinse of a triple rinse. A request may be submitted 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 department may waive pretreatment for these 2 wastewaters only if the new source makes the demonstrations and is in compliance with s. NR 211.10.

Section 28. Chapter NR 233 Subchapter VI is created to read:

Subchapter VI

Repackaging of Agricultural Pesticides Performed at Refilling Establishments

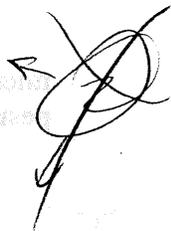
NR 233.50 Applicability; description of repackaging of agricultural pesticides performed by refilling establishments subcategory. (1) This subchapter is applicable to discharges resulting from all repackaging of agricultural pesticides performed by refilling

establishments as defined in s. NR 233.03, whose primary business is wholesale or retail sales, and where no pesticide manufacturing, formulating or packaging occurs, except as provided in

NR 233.55 New source performance standards (NSPS). Any new source subject to this subchapter which discharges process wastewater pollutants may not discharge process wastewater pollutants to navigable waters.

NR 233.56 Pretreatment standards for existing sources (PSES). Except as provided in ss. NR 211.13 and 211.14, no later than November 6, 1999, any existing source subject to this subchapter which introduces pollutants into a POTW shall comply with ch. NR 211 and achieve the pretreatment standards for existing sources as follows. There may be no discharge of process wastewater pollutants to navigable waters.

NR 233.57 Pretreatment standards for new sources (PSNS). Except as provided in ss. NR 211.13 and 211.14, any new source subject to this subchapter which introduces pollutants into a POTW shall comply with ch. NR 211 and achieve the pretreatment standards for existing sources as follows. There may be no discharge of process wastewater pollutants to navigable waters.



**Table 8
List of Pollution Prevention Alternative Practices**

② no treatment clauses for
the tables:

③ is the table starting on p 31 continued
of Table 10? if so, make clearer

Practice	Modification allowed when:
	formulation to exceed the ranges allowed in the confidential statement of formula pursuant to 40 CFR 158.155.
<p>8. When performing rinsing of raw material drums, storage drums, or shipping containers that contained liquid pesticide active ingredients or inert ingredients for the formulation of solvent-based products, the facility shall reuse the drum or shipping container rinsate directly into the formulation at the time of formulation or store for use in future formulation of same or compatible product.</p>	<p>(a) The drum or shipping container holds inert an ingredient only and 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;</p> <p>(b) 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 or;</p> <p>(c) Drums or shipping containers are going to a drum refurbisher or recycler who will only accept drums rinsed with water.</p>
<p>9. Shall 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 or aqueous changeover rinsate as part of their pollution prevention allowable discharge (i.e., the facility must achieve zero discharge of those process wastewater pollutants).</p>	<p>Facility has installed and is using a solvent recovery system for the changeover rinsate. It also may be used for other solvent recovery.</p>
<p>10. Shall store the rinsate from interior rinsing. This does not include drum or shipping container rinsate for reuse in future formulation of same or compatible product.</p>	<p>(a) Facility has evidence of biological growth or other product deterioration over a typical storage period;</p> <p>(b) Facility has space limitations, but must still store rinsates for most frequently produced products;</p> <p>(c) Manufacturer or formulator contracting for toll formulating has directed otherwise i.e., send back to them or send for off-site disposal;</p>

Practice	Modification allowed when:
	<p>(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;</p> <p>(e) Facility only performs packaging of the pesticide product from which interior rinsate is generated; or</p> <p>(f) Facility has demonstrated that it must use a detergent to clean the equipment.</p>

Table 9
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).

22

16

Shaughnessey
code

Chemical name¹

- 128934² Nitrogen, liquid.
 129029 Bergamot Oil.
 224600 Diethanolamides of the fatty acids of coconut oil (coded 079).
 505200 Isoparaffinic hydrocarbons.

Notes

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 pesticide active ingredient will persist in sanitary streams long enough to reach a POTW.

Shaughnessey Code	Chemical Name	FATES Code	Chemical Name
128934	Nitrogen, liquid.	001	Nitrogen, liquid.
129029	Bergamot Oil.	002	Bergamot Oil.
224600	Diethanolamides of the fatty acids of coconut oil (coded 079).	003	Diethanolamides of the fatty acids of coconut oil (coded 079).
505200	Isoparaffinic hydrocarbons.	004	Isoparaffinic hydrocarbons.
005	Chlorobenzene	005	Chlorobenzene
006	1,4-Dichlorobenzene	006	1,4-Dichlorobenzene
007	1,2-Dichlorobenzene	007	1,2-Dichlorobenzene
008	1,3-Dichlorobenzene	008	1,3-Dichlorobenzene
009	1,1-Dichloroethane	009	1,1-Dichloroethane
010	1,1,1-Trichloroethane	010	1,1,1-Trichloroethane
011	1,1,2-Trichloroethane	011	1,1,2-Trichloroethane
012	1,1,1,2-Tetrachloroethane	012	1,1,1,2-Tetrachloroethane
013	1,1,2,2-Tetrachloroethane	013	1,1,2,2-Tetrachloroethane
014	1,1,1,1-Tetrachloroethane	014	1,1,1,1-Tetrachloroethane
015	1,1,1,2,2-Pentachloroethane	015	1,1,1,2,2-Pentachloroethane
016	1,1,1,1,2-Pentachloroethane	016	1,1,1,1,2-Pentachloroethane
017	1,1,1,2,2,2-Hexachloroethane	017	1,1,1,2,2,2-Hexachloroethane
018	1,1,2,2,2-Hexachloroethane	018	1,1,2,2,2-Hexachloroethane
019	1,1,1,2,2,2-Hexachloroethane	019	1,1,1,2,2,2-Hexachloroethane
020	1,1,1,2,2,2-Hexachloroethane	020	1,1,1,2,2,2-Hexachloroethane
021	1,1,1,2,2,2-Hexachloroethane	021	1,1,1,2,2,2-Hexachloroethane
022	1,1,1,2,2,2-Hexachloroethane	022	1,1,1,2,2,2-Hexachloroethane
023	1,1,1,2,2,2-Hexachloroethane	023	1,1,1,2,2,2-Hexachloroethane
024	1,1,1,2,2,2-Hexachloroethane	024	1,1,1,2,2,2-Hexachloroethane
025	1,1,1,2,2,2-Hexachloroethane	025	1,1,1,2,2,2-Hexachloroethane
026	1,1,1,2,2,2-Hexachloroethane	026	1,1,1,2,2,2-Hexachloroethane
027	1,1,1,2,2,2-Hexachloroethane	027	1,1,1,2,2,2-Hexachloroethane
028	1,1,1,2,2,2-Hexachloroethane	028	1,1,1,2,2,2-Hexachloroethane
029	1,1,1,2,2,2-Hexachloroethane	029	1,1,1,2,2,2-Hexachloroethane
030	1,1,1,2,2,2-Hexachloroethane	030	1,1,1,2,2,2-Hexachloroethane

23

Table 10
List of Appropriate Pollution Technologies

PAI Name	PAI Code	Shaughnessy Code	Structural Group	Treatment Technology
Dicofol	001	10501	DDT	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.
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.

24

PAI Name	PAI Code	Shaughnessy Code	Structural Group	Treatment Technology
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	Phosphoramidothioate	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.

PAI Name	PAI Code	Shaughnessy Code	Structural Group	Treatment Technology
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.
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.

PAI Name	PAI Code	Shaughnessy Code	Structural Group	Treatment Technology
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.
Methodathion	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.

PAI Name	PAI Code	Shaughnessy Code	Structural Group	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.

PAI Name	PAI Code	Shaughnessy Code	Structural Group	Treatment Technology
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.
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.
Terbutylazine	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.

List of Appropriate Pollution Technologies (Non-272 PAIs)

PAI Name	Shaughnessy Code	Structural Group	Treatment Technology
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	Benzencamine	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.

PAI Name	Shaughnessy Code	Structural Group	Treatment Technology
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.
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.

PAI Name	Shaughnessy Code	Structural Group	Treatment Technology
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 (Cu ₂ Cl(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.

PAI Name	Shaughnessy Code	Structural Group	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, risodium 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 midazolium chloride.	46608	NR4	Activated Carbon.

34

PAI Name	Shaughnessy Code	Structural Group	Treatment Technology
Hydroxyethyl)-2-alkyl-2-imidazoline (as in fatty acids of t. IBA)	46609	NR4	Activated Carbon.
Dihydropyrone	46701	Bicyclic	Activated Carbon.
Butoxypolypropoxypolyethoxyethanol-iodine complex.	46801	Cyclic ketone	Activated Carbon.
Polyethoxypolypropoxyethanol-iodine complex.	46901	Polymer	Activated Carbon.
Use code no. 046904 (polyethoxypolypropoxy ethanol-iodine complex).	46904	Polymer	Activated Carbon.
Iodine-potassium iodide complex	46909	Polymer	Activated Carbon.
Alkyl-omega hydroxypoly(oxyethylene)-iodine complex *(100%.	46917	Inorganic	Pollution Prevention.
Lead acetate	46921	Polymer	Activated Carbon.
Nickel sulfate hexahydrate	48001	Metallic	Precipitation.
Maleic hydrazide, diethanolamine salt.	50505	Metallic	Precipitation.
Maleic hydrazide, potassium salt.	51502	Hydrazide	Activated Carbon.
Sodium 2-mercaptobenzothiolate	51503	Hydrazide	Activated Carbon.
Mercuric chloride	51704	Heterocyclic	Activated Carbon.
Mercurous chloride	52001	Metallic	Precipitation.
Metaldehyde	52201	Metallic	Precipitation.
Methylated naphthalenes	53001	Miscellaneous Organic	Activated Carbon.
Sodium 2,2'-methylenebis(4-chlorophenate)	54002	Aryl	Activated Carbon.
Naphthalene	55005	Chlorophene	Activated Carbon.
NAD	55801	Aryl	Activated Carbon.
NAA (1-Naphthaleneacetic Acid)	56001	Benzoic Acid	Activated Carbon.
Potassium 1-naphthaleneacetate	56002	Benzoic Acid	Activated Carbon.
Ammonium 1-naphthaleneacetate	56003	Benzoic Acid	Activated Carbon.
Sodium 1-naphthaleneacetate	56004	Benzoic Acid	Activated Carbon.
Ethyl 1-naphthaleneacetate	56007	Benzoic Acid	Activated Carbon.
Nitrophenol	56008	Benzoic Acid	Activated Carbon.
Nicotine	56301	Phenol	Activated Carbon.
Carbophenothion (ANSI)	56702	Pyridine	Activated Carbon.
Sodium 5-chloro-2-(4-chloro-2-(3-(3,4-dichlorophenyl)ureido).	58102	Phosphorodithioate	Activated Carbon.
Monocrotophos	58802	Aryl Halide	Activated Carbon.
Chlordimeform	58901	Phosphate	Activated Carbon.
Chlordimeform hydrochloride	59701	Chloropropionanilide	Activated Carbon.
	59702	Chloropropionanilide	Activated Carbon.

PAI Name	Shaughnessy Code	Structural Group	Treatment Technology
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.

36

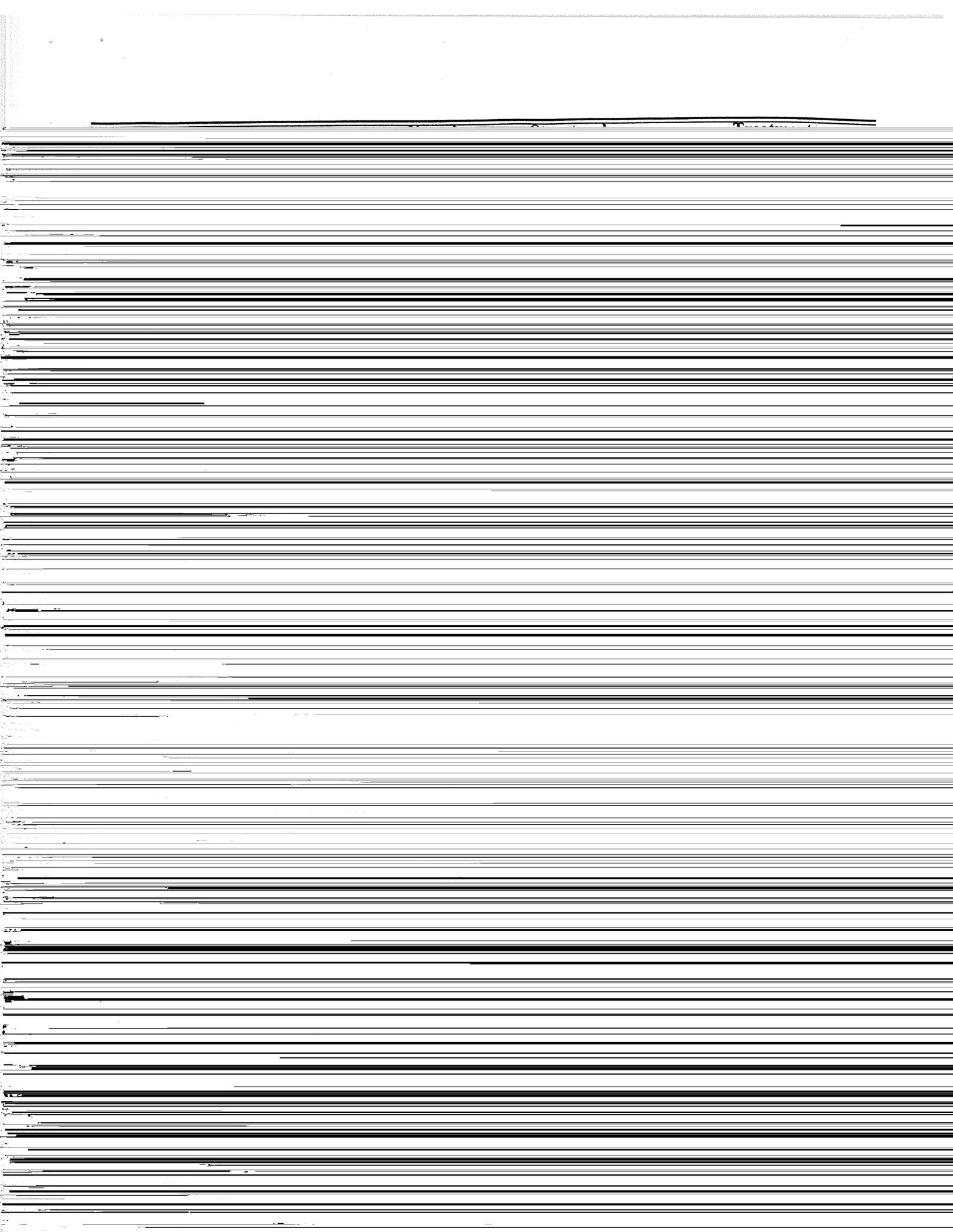
PAI Name	Shaughnessy Code	Structural Group	Treatment Technology
Isovaleryl-1,3-indandione, calcium salt.	67706	Indandione	Activated Carbon.
Methyl isothiocyanate	68103	Thiocyanate	Pollution Prevention.
Potassium dichromate	68302	Inorganic	Pollution Prevention.
Sodium chromate	68303	Inorganic	Pollution 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.
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.

PAI Name	Shaughnessy Code	Structural Group	Treatment Technology
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.

PAI Name	Shaughnessy Code	Structural Group	Treatment Technology
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.
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.
Pentanthiol	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.

PAI Name	Shaughnessy Code	Structural Group	Treatment Technology
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.
Trimethoxysilylpropyl dimethyl octadecyl ammonium chloride.	107401	NR4	Activated Carbon.
Kinoprene	107502	Ester	Activated Carbon.
Triforine (ANSI)	107901	Hydrazide	Activated Carbon.
Pyrimiphos-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.
Tartrazine	110302	Hydrazide	Activated Carbon.

40



PAI Name	Shaughnessy Code	Structural Group	Treatment Technology
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.
Clofentezine	125501	Aryl Halide	Activated Carbon.
Paclbutrazol	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.

42

PAI Name	Shaughnessy Code	Structural Group	Treatment Technology
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, 2B ₂ O ₃ , 3.5H ₂ O; 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.

PAI Name	Shaughnessy Code	Structural Group	Treatment Technology
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.
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-isothiazolin-3-one)	229300	Heterocyclic	Activated Carbon.
Diethyl ethyl	279500	Toluidine	Activated Carbon.
Hydroprene (ANSI)	486300	Miscellaneous Organic	Activated Carbon.
Zinc sulfate monohydrate	527200	Metallic	Precipitation
Geraniol	597501	Alcohol	Activated Carbon.

Notes

1. 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 pesticide active ingredient 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 pesticide active ingredient specific and may need to be used in conjunction with one another to provide treatment for all pesticide active ingredients 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 pesticide active ingredients whose technology is listed as "pollution prevention", the permitting authority or control authority can determine if additional treatment is necessary through best professional judgment or best engineering judgment, respectively.

2. The 272 pesticide active ingredients are listed first, by pesticide active ingredient code, followed by the non-272 pesticide active ingredients from the 1988 FIFRA and TSCA Enforcement System (FATES) Database, which are listed in shaughnessy code order. Pesticide active ingredients that were exempted or reserved from the PFPR effluent guidelines are not listed in the table.

44

3. The non-272 pesticide active ingredient names are taken directly from the 1988 FATES database. Several of the pesticide active ingredient names are truncated because the pesticide active ingredient names listed in the FATES database are limited to 60 characters.

4. The non-272 pesticide active ingredients do not have pesticide active codes.

5. All shaughnessy codes are taken from the 1988 FATES database. Some of the 272 pesticide active ingredients are not listed in the 1988 FATES database; therefore, no shaughnessy codes are listed for these pesticide active ingredients.

6. Structural groups are based on an analysis of the chemical structures of each pesticide active ingredient.

7. EPA has also received data indicating that acid hydrolysis may also be effective in treating this pesticide active ingredient

* This pesticide active ingredient code represents a category or group of pesticide active ingredients; therefore, it has multiple shaughnessy codes.

eff. date

45