UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

000R77101

JECT Best Conventional Pollutant Control Technology (BCT) Rulemaking Package

FROM Allen Leduc, Office of Analysis and Evaluation

TO EPA Regional Librarians

Enclosed is a copy of the RMP described above. This package is the result of the 1977 Clean Water Act Amendments. Included in the package are the regulatory changes proposed as a result of the secondary industry review and the proposed test of "reasonableness" required to set BCT.

Listed in Appendix A of Tab A are the documents used as data sources in the secondary industry review. Please have these available for public inspection. If you receive a request for a document listed which you do not have, please request a copy from the Headquarters library or call me at 8-426-2617.

Please have the RMP available for public inspection during your regular business hours. Thank you.

Enclosures: Tab A Federal Register Notice

Tab B Effluent Guidelines; Model Plant Analyses Summaries

Tab C Cost Estimates for Municipal Treatment Systems.

AK —
AB —

6971

EPA FORM 320-6 (REV 3-76)

[40 CFR Parts 400-469]

BEST CONVENTIONAL POLLUTANT

CONTROL TECHNOLOGY

Reasonableness of Existing Guidelines

AGENCY: ENVIRONMENTAL PROTECTION AGENCY (EPA).

ACTION: Proposed rules.

SUMMARY: EPA has reviewed certain existing effluent guideline limitations for best available technology economically achievable (BAT) which have been promulgated for conventional pollutants. These guidelines have been reviewed to determine if they are not only economically achievable, but are also reasonable. For those guidelines which are reasonable, EPA is proposing that the BAT control of conventional pollutants be redefined as best conventional pollutant control technology (BCT). For those guidelines which are unreasonable, EPA is proposing that the existing BAT controls for conventional pollutants be withdrawn, leaving best practicable control technology currently available (BPT) in place as the limitation of record until new BCT limitations are developed.

DATES: Comments must be received on or before (60 days after publication)

ADDRESS: Send comments on this proposal to: Mr. David Fege, Environmental Protection Agency, Office of Analysis and Evaluation (WH-586), 401 M St. SW, Washington, D.C. 20460

FOR FURTHER INFORMATION CONTACT: Mr. David Fege, Water Economics

Branch (WH-586), 401 M St. SW, Washington, D.C. 20460

(Phone:202-426-2617)

SUPPLEMENTARY INFORMATION

Background

Section 304(b)(4) of the Clean Water Act (the Act) establishes 'best conventional pollutant control technology' (BCT) for existing industrial point sources that discharge conventional pollutants. BCT is not an additional limitation but replaces 'best available technology economically achievable' (BAT) for the control of conventional pollutants. BAT will remain in force for all non-conventional and toxic pollutants. The purpose of BCT is to add an additional test to the effluent limitation process. Whereas the Act previously required that BAT limitations be economically achievable, BCT also requires that the cost associated with the limitations be reasonable in relation to the effluent reductions.

In the determination of BCT for each point source subcategory the Act states that EPA must consider the:

> reasonableness of the relationship between the costs of attaining a reduction in effluents and the effluent reduction benefits derived, and the comparison of the cost and level of reduction of such pollutants from the discharge of publically owned treatment works to the cost and level of reduction of such pollutants from a class or category of industrial sources,...

The Act also lists other considerations including, but not limited to, age of equipment, production processes, energy requirements,

and other appropriate factors. The legislative language clearly indicates that final BCT effluent guidelines limitations cannot be more stringent than present BAT guidelines or less stringent than "best practicable control technology currently available' (BPT) guidelines.

In addition, Section 73 of the Clean Water Act of 1977 directs the Agency to review, immediately, all existing final or interim final BAT effluent guidelines for conventional pollutants in those industries not covered in the Consent Agreement [NRDC v. Train, 8 ERC 2120 (D.D.C. 1976)]. These industries are often referred to as "secondary industries". This review was to be completed within 90 days of enactment of the Act (March 27, 1978).

Industries Covered by this Review

As directed by Congress, in this review EPA has evaluated all BAT regulations for conventional pollutants which apply to industries not covered by the NRDC Consent Agreement (those not listed in Table 2 of Committee Print Numbered 95-30 of the Committee on Public Works and Transportation of the House of Representatives). Those 13 industries with final or interim final BAT guidelines which were studied are listed in Tables 1 and 2. However, complete analysis has not been carried out on all of these industry subcategories. If BPT and BAT do not allow a discharge of process waste water, or BAT control is equivalent to BPT, no change in limitations is proposed. Since BPT is the minimum limitation

allowed, no analysis is required because BAT represents no further control past BPT. The subcategories which fell into this group are listed in Table 1. The ninety-three subcategories in Table 2 were studied further.

Due to the large number of effluent guidelines under review, and especially due to the Congressional directives to perform a brief review, the Agency restricted its gathering of data for this review to the development documents and the economic analyses documents (see Appendix A) which were published in support of the promulgation of the BAT guidelines for each industrial category.

Pollutants Covered by the Review

Section 304(a)(4) of the Act specifies that conventional pollutants should include, but not be limited to, biological oxygen demanding pollutants (BOD5), total suspended solids (TSS), fecal coliform, and pH. The Agency, in a separate action, is proposing that chemical oxygen demanding pollutants (COD), oil and grease, and total phosphorus be added to the conventional pollutant list. This review of BAT effluent guidelines assumes the addition of these pollutants to the conventional pollutant list and includes them in the analysis of reasonableness where appropriate. If, at any time, pollutants are added or deleted from the conventional pollutant list, the Agency will reevaluate all effluent guidelines affected by such revisions.

However, in the case of both fecal coliform and pH, the BAT

regulations under review are always equivalent to BPT regulations. Therefore, no further analysis has been performed on these pollutants, and BCT controls of pH and fecal coliform are being proposed to be the same as BPT. Consequently, the pollutants considered in this review are BOD5, TSS, COD, oil and grease, and total phosphorous.

This review of BAT guidelines concentrates only on discharges of process wastewater. BAT guidelines which refer to the control rainwater run-off (e.g., sizing of a treatment system to contain a 25-year storm or catastrophic event) are not included in the review because the Agency does not believe that this was the intent of Congress. The legislative history specifically indicates that BCT applies to the control of process wastewater as the area of concern. Also, run-off regulations are not amenable to analysis using the BCT test called for in the legislation.

Methodology for Determining Reasonableness of BAT Regulations

The objective of this review is to evaluate existing BAT regulations to determine whether these regulations meet the reasonableness criteria for BCT limitations.

The Agency has developed a cost test which it believes is in keeping with the Congressional mandate to establish BCT effluent limitations. The Act states that the EPA shall consider the "reasonableness of the relationship between the costs of attaining

a reduction in effluents and the effluent reduction benefits derived." The legislative history indicates that the intent of the Congress was to find that point at which additional levels of control resulted in greatly increased costs with only minor additional reductions in effluents. The history of the legislation further states that one method of determining the reasonableness of this relationship is the comparison of the cost and level of reduction of conventional pollutants from the discharge of publicly owned treatment works (POTW) to the cost and level of reduction of the same pollutants by industrial sources. Although one may interpret this to mean two cost tests, the legislative history supports the Agency's position that only one test is required. The history establishes the concept of reasonableness as a factor in the determination of BCT, and then states that a POTW comparison is a proper mechanism for determining reasonableness. Therefore, the Agency has developed a POTW cost comparison as a basis for determining the reasonableness of BCT limitations.

In summary, the BCT test compares the additional cost incurred by an industrial point source to remove an additional pound of conventional pollutants beyond BPT limitations, to the cost incurred by a POTW of a similar flow to remove an additional pound of conventional pollutants at a similar level of stringency. If the industrial cost is lower, the control of conventional pollutants for the BAT effluent guideline

limitation is considered reasonable and the controls of conventional pollutants are being proposed as BCT limitations.

A second test is applied in those instances where the industrial cost is higher than the cost to a POTW of comparable flow. The final industrial effluent concentration of conventional pollutants is compared to the final effluent concentration of conventional pollutants in POTWs with secondary treatment. If the concentration of conventional pollutants is significantly higher for the industrial point source, the BAT effluent guidelines are considered reasonable, because the performance of the industrial plant should approach the technological performance of the POTW. If the industrial concentrations are not significantly higher, then the regulation is unreasonable because not only are the costs higher, but the performance is similar to that of a POTW. More explicitly, the evaluation was conducted in the following steps.

1. <u>Calculation of Industrial Costs</u>: The incremental annual costs are calculated by determining the difference between the annual costs for a model plant representing an industrial subcategory to achieve BPT and the annual costs to achieve BAT. Annual costs include operation and maintenance expenses, capital costs and depreciation. These costs have been updated to 1976 dollars.

2. <u>Calculation of Industrial Pollutant removal:</u> The

incremental removal of conventional pollutants is calculated by determining the difference between the annual removal of conventional pollutants after compliance with BPT and the annual removal of conventional pollutants after compliance with BAT. EPA has grouped conventional pollutants into three categories: nutrients (phosphorous), suspended solids (TSS) and oxygen demanding substances (BOD5, COD and oil and grease). (For those industries under review, no regulation required increased controls of pH and fecal coliform, and therefore these pollutants were not considered in the review.) For the industrial subcategory, the incremental costs of removal attained from BPT to BAT are calculated using one pollutant from each group. If a group is not represented, then it is not included in the evaluation. Table 3 details which pollutants are used in the calculation depending on which are regulated.

3. Calculation of the Industrial Ratio: The ratio of incremental annual costs to incremental conventional pollutant removal is then calculated. That is:

$$\frac{\text{BAT Annual Costs} - \text{BPT Annual Costs}}{\text{BAT pounds of conventional pollutants removed} - \text{BPT pounds of conventional pollutants removed}}$$

This ratio represents the average annual incremental cost to remove a pound of conventional pollutants in terms of dollars per pound. It provides an idea of the "cost-effectiveness" of

conventional pollutant removal beyond BPT.

4. <u>Calculation of POTW Cost-Effectiveness Ratio:</u> A ratio similar to the industrial ratio is calculated to determine the average incremental annual cost to remove conventional pollutants from POTWs. (POTW costs have been updated to 1976 dollars). The incremental cost of removing a pound of BOD5 and TSS when progressing from normal secondary treatment (effluent with 30 parts per million of BOD5 and TSS each) to better secondary treatment (effluent with 12 parts per million of BOD5 and TSS each) is computed for POTW's that are larger than one million gallons per day (GPD). For POTWs between 10,000 GPD and 1 million GPD, the difference of average annual costs to remove a pound of BOD5 and TSS between faculative lagoons (effluent of 30 parts per million of BOD5 and 60 parts per million of TSS) and package treatment plants (effluent of 25 parts per million of BOD5 and 25 parts per million of TSS) is determined. Different sized treatment plants are used because EPA generally does not require the same treatment level for small municipal treatment plants.

A separate calculation was made for removal of phosphorous in POTWs which is based on the costs and removals of a treatment system for phosphorus removal which is added to secondary treatment. Appendix B contains a more detailed discussion of the POTW cost ratio, while Appendix C details the cost data used in making these decisions.

5. Comparison of Industrial and POTW ratios: In order to determine whether or not the industrial regulation under review meets BCT requirements for reasonableness, the ratio for the industrial subcategory is compared to the POTW ratio for a POTW of the same flow. In this review, if the industrial ratio is less than the POTW ratio, then the BCT regulation is equated to BAT, and no further analysis is done.

6. Concentration of Conventional Pollutants: For those BAT regulations which have higher costs than POTWs, a second test is applied to assure that the final effluent concentrations of conventional pollutants are not significantly higher than those found in POTWs with normal secondary treatment. If the concentration of conventional pollutants is significantly larger, then this review is proposing that BCT be equivalent to existing BAT (i.e. the limitation is considered reasonable even though the costs are higher). The concentration test is used as a final check to insure that the industrial subcategory is not discharging at significantly higher concentration levels than a POTW, and also to give the Agency some guidance when the results of the cost test are close. It is not designed to be a rigid test, but rather, to be a flexible tool for those cases where the cost test does not give clear guidance on whether the regulation meets the BCT requirement.

Summary of Determinations

Table 4 summarizes the results of the review.

Based on this review the Agency has determined that the BAT control of conventional pollutants for 50 subcategories are reasonable and is proposing that BCT for these 50 subcategories be equal to the current BAT guidelines. Most of the reasonable regulations are comprised of subcategories from the following industries: dairy products, fruit and vegetable processing, seafood processing, and grain milling industries.

Sixteen of the subcategory regulations are unreasonable, and consequently, the Agency is proposing to withdraw the BAT effluent guidelines for conventional pollutants until such time that proper levels of control can be determined. Regulations that are unreasonable are found in the glass manufacturing industry, the fruit and vegetable processing industry, the grain milling industry, the ferroalloy manufacturing industry, and the cement industry. In the case of one subcategory in the fruit and vegetable industry (apple products), the BAT control is reasonable for the large model plant and unreasonable for the small model plant. Therefore the Agency is proposing to withdraw the regulations for all plants smaller than a 100 tons per day plant. Similarly, for the crystalline cane sugar refining subcategory, the BAT control is reasonable for the large model plant and unreasonable for the small model plant. Therefore the Agency is proposing to withdraw the regulations for all plants producing less than 2100 tons per day of melt. The Agency

requests comments on this proposed split of these subcategories.

For fourteen subcategories in the seafood processing industry the Agency has determined that it does not have sufficient data to properly assess the BAT guidelines and is proposing to withdraw the BAT control of conventional pollutants until further analysis can be performed.

For four meat processing subcategories, part of the BAT guidelines have been remanded by the courts. The Agency will evaluate the control of conventional pollutants when the analysis required by the remand is complete. In the interim, the Agency is proposing to suspend BAT control of conventional pollutants (except pH and fecal coliform which were not remanded) in these regulations.

Seven subcategories in the asbestos manufacturing industry were determined not to be part of this review, since the BAT control of zero discharge is designed to remove toxic pollutants.

For all other subcategories (see Table 2), including these subcategories where pH or fecal coliform are controlled, the BAT control of conventional pollutants is equal to the BPT control of conventional pollutants. Since the legislative history clearly indicates that BCT cannot be more stringent than BAT nor less stringent than BPT, further analysis is not required. Therefore, the Agency is proposing that the BCT control of conventional

pollutants for these subcategories be equal to the present BAT control.

More detailed discussion of the proposed determinations for each industrial subcategory is presented in Appendix D.

Issues Regarding BCT Evaluation

1. *Nature of the POTW Test*: A major focus of concern is the BCT test itself. There are many types and variations of tests which can be defensibly employed. A methodology is being proposed here which is relatively simple and easy to apply, and which seems to result in sensible determinations.

The test compares the incremental costs per pound of pollutant removed between BPT and BAT to an incremental cost for POTWs at similar levels of stringency. This approach determines the cost to remove the last few pounds of pollutants at either the POTW or industrial subcategory under consideration. The alternative approach would be to compare average costs per pound of pollutant removed from no control to BCT levels, or in the case of the POTWs, from no control to secondary treatment. This may result in more stringent BCT limitations. The primary reason that the incremental approach has been selected over the comparison of average costs is that the focus of BCT control should be to determine the appropriate amount of additional control beyond BPT. In fact, Congressional intent is that there should not

be a reevaluation of BPT or the costs associated with it since Congress specified that BCT should be more than or equal to BPT.

An additional issue involves the size of the POTW with which the model plant is being compared. The test proposed here compares the costs of an industrial plant with the costs for a POTW of the same flow. This approach determines whether the cost of industrial treatment compares favorably with the costs of a POTW treatment system of similar flow. An alternative approach is to compare the industrial costs to a single cost figure for a POTW of a "typical" size. The Agency has evaluated three potential typical sizes:

1. a small POTW (20,000 gallons per day)
2. a median size POTW (150,000 gallons per day)
3. an average size POTW (6 million gallons per day)

If a small POTW is used as the typical size, the POTW value to which all industrial model plants would be compared is $1.72 per pound of pollutant removed. This criteria would result in a more stringent BCT test with fewer unreasonable BAT regulations. Under this circumstance, BAT regulations for 11 complete subcategories would not meet the BCT test. These 11 subcategories also fail the BCT test using the proposed methodology. Parts of four other subcategories also would not pass the test. (For these 4 subcategories, some of the model plants in the specific subcategory pass while

others fail, thus causing a 'split' for that subcategory.)

If the median size POTW is used as the typical size, the POTW value would be $1.20 per pound, causing 13 subcategories to fail the test. A total of 8 subcategories would be split.

An average size POTW cost is $.82 per pound and BAT for 21 subcategories would be unreasonable; the 16 subcategories that are unreasonable using the present methodology are included in this total. Eight subcategories would be split.

The Agency has not used the 'typical' POTW approach for two reasons. First, the selection of a 'typical' size POTW is difficult. As can be seen from the examples above, there are several logical choices, each leading to different conclusions. Second, the comparison of model plants to POTWs of similar flows entails a comparison involving similar technical factors; however, it also compares the cost of the private sector to the cost that society is willing to pay to clean the same volume of effluent in municipal plants. The Agency believes that this comparison is in keeping with the intent of the Act.

2. Calculation of Pollutant Removal: When more than one pollutant from the same class (i.e. oxygen demanding, solids, or nutrients) are regulated in an industrial subcategory, the methodology considers at most one pollutant from each class. Thus, if BOD_5 and COD were controlled, only the BOD_5 would be

used in the BCT test because if the pounds of BOD5 and COD removed were totaled, significant double-counting would occur, and the cost per pound for the subcategory would be lowered. This would result in more stringent BCT regulations than proposed. (See Appendix B.)

3. Ability of methodology to handle future additions to the conventional pollutant list: A concern is whether the proposed BCT tests will be applicable for additions to the conventional pollutants list. Because it is impossible to predict which pollutants will be added in the future, and consequently, difficult to assess the suitability of the methodology, applicability of the test for additions to the list will be considered at the time that the pollutants are added. It is believed that the proposed methodology is flexible enough to handle the three proposed additions to the conventional pollutant list (under separate rulemaking) as well as any other possible addition.

4. Applicability to regulations which control conventional, non-conventional and toxic pollutants: A problem that will occur, especially when the BCT evaluation is applied to primary industries, is the allocation of control costs for an industrial subcategory in which toxic or non-conventional pollutants are regulated in addition to conventional pollutants. In those cases, EPA may make

an exception to the BCT test, and evaluate whether or not the BAT technology is required to control toxic and/or non-conventional pollutants, regardless of coincident control of conventional pollutants. In these cases, the costs to control conventional pollutants can only be estimated. Comment is requested on this approach.

Economic Impact Analysis

Executive Order 12044, Improving Government Regulations, does not apply to this proposed action because this proceeding was pending at the time the order was issued. However, as called for in the Executive Order, the Agency has examined a number of different alternatives to the proposed BCT test, and these are discussed in Appendix E.

Because the proposed BAT guidelines will, in no instance, be more stringent than the previous BAT guidelines, no additional economic impact will occur. The economic impacts of the BAT regulations were already considered in the development of those regulations and were judged to be acceptable. Although waivers may not be obtained for BCT limits, all economic analysis of BAT limitations was performed under the assumption that no waivers would be granted. In those cases where BAT regulations are determined to be unreasonable, new BCT will be less stringent than the original BAT regulations, and thus will require less investment expenditures than were originally required. Until new BCT limitations are developed, however, investment savings will be unknown.

Comments Invited

The Agency urges interested individuals to submit comments on the methodological approach that was used to determine reasonableness and to define BCT. It must be emphasized that the methodology establishes the definition of reasonableness, and thus comments should focus on the appropriateness of the proposed methodology or alternative methodologies. All comments received by (60 days after publication) will be considered in the promulgation of BCT effluent limitation guidelines.

Information Available

Copies of this Federal Register notice can be obtained, without charge, by contacting: Anne Andrews, Environmental Protection Agency, 401 M St. SW (WH-586), Washington, D.C. 20460 (202-426-2617).

The costs and pollutant removal data used in this review are taken from the development documents and economic analyses that were published in the development of BAT guidelines. These documents are available for public inspection at all EPA regional libraries and the EPA headquarters library in Washington, D.C. Also, a 200 page summary of cost and removal data is open to public inspection at the above libraries. Location of the regional and headquarters libraries are included in Appendix F.

In consideration of the foregoing, effected 40 CFR Parts 400-469 are hereby proposed to be amended as set forth below.

Dated:____________________, 1978

____
Administrator

TABLE 1

Industries and Subcategories Which Did Not Require Further Analysis

Grain Mills (4):	
Normal Wheat Flour Milling	Animal Feed
Normal Rice Milling	Hot Cereal
Cement Manufacturing (2):	
Non-Leaching	Materials Storage Piles Runoff
Feedlots (1):	
All Subcategories Except Ducks	
Fertilizer (4):	
Phosphate	Ammonium Sulfate Production
Ammonia	Mixed and Blend Fertilizer Production
Phosphate Manufacturing (2):	
Deflourinated Phosphate Rock	Deflourinated Phosphoric Acid
Ferroalloys Manufacturing (1):	
Other Calcium Carbide Furnaces	
Glass Manufacturing (2):	
Sheet Glass Manufacturing	Rolled Glass Manufacturing
Asbestos Manufacturing (4):	
Asbestos Millboard	Solvent Recovery
Coating or Finishing of Asbestos Textiles	Vapor Absorption

TABLE 2

Industries and Subcategories Which were Studied

Dairy Products Processing (12):

- Receiving Stations
- Fluid Products
- Cultured Products
- Butter
- Cottage Cheese and Cultured Cream Cheese
- Natural and Processed Cheese
- Fluid Mix for Ice Cream and other Frozen Desserts
- Ice Cream, Frozen Desserts Novelties and other Dairy Desserts
- Dry Milk
- Condensed Whey
- Dry Whey
- Condensed Milk

Grain Mills (6):

- Corn Wet Milling
- Corn Dry Milling
- Bulgur Wheat Flour Milling
- Parboiled Rice Processing
- Ready-to eat Cereal
- Wheat Starch and Gluten

Canned and Preserved Fruits and Vegetables Processing (8):

- Apple Juice
- Apple Products
- Citrus Products
- Frozen Potato Products
- Dehydrated Potato Products
- Canned and Preserved Fruits
- Canned and Preserved Vegetables
- Canned and Miscellaneous Specialities

Canned and Preserved Seafood Processing (28):

- Farm Raised Catfish
- Conventional Blue Crab
- Mechanized Blue Crab
- Non-Remote Alaskan Crab Meat
- Remote Alaskan Crab Meat
- Non-Remote Alaskan Whole Crab and Crab Section
- Non-Alaskan Scallop Processing
- Remote Alaskan Whole Crab and Crab Section
- Dungeness and Tanner Crab Processing in the Contiguous States
- Non-Remote Alaskan Shrimp
- Remote Alaskan Shrimp
- Tuna Processing
- Fish Meal Processing
- West Coast Hand Butchered Salmon Processing
- West Coast Mechanized Salmon Processing
- Non-Alaskan Conventional Bottom Fish
- Non-Alaskan Mechanized Bottom Fish Processing
- Hand-Shucked Clam Processing
- Mechanized Clam Processing
- Pacific Coast Hand-Shucked Oyster Processing

Northern Shrimp Processing in the Contiguous States
Southern Non-Breaded Shrimp Processing in the Contiguous States
Non-Alaskan Whole Crab and and Crab Section Processing
Breaded Shrimp Processing in the Contiguous States
Atlantic and Gulf Coast Hand-Shucked Oyster Processing
Steamed and Canned Oyster Processing
Sardine Processing
Non-Alaskan Herring Fillet Processing
Abalone Processing

Sugar Processing (3):

Beet Sugar Processing
Crystalline Cane Sugar Refining
Liquid Cane Sugar Refining

Cement Manufacturing (1):

Leaching

Feedlots (1):

Ducks

Phosphate Manufacturing (1):

Sodium Phosphates

Ferroalloys Manufacturing (6):

Open Electric Furnaces with Wet Air Pollution Control Devices
Covered Electric Furnaces and other Smelting Operations with Wet Air Pollution Control Devices
Slag Processing
Covered Calcium Carbide with Wet Air Pollution Control Devices
Electrolytic Manganese Products
Electrolytic Chromium

Glass Manufacturing (10):

Insulation Fiberglass
Plate Glass Manufacturing
Float Glass Manufacturing
Automotive Glass Tempering
Automotive Glass Laminating
Glass Container Manufacturing
Glass Tubing (Danner) Manufacturing
Television Picture Tube Envelope Manufacturing
Incandescent Lamp Envelope Manufacturing
Hand Pressed and Blown Glass Manufacturing

Asbestos Manufacturing (7):

- Asbestos-Cement Pipe
- Asbestos-Cement Sheet
- Asbestos Papar (Starch Binder)
- Asbestos Paper (Elastomeric Binder)
- Asbestos Roofing
- Asbestos Floor Tile
- Wet Dust Collection

Meat Products (10):

- Simple Slaughterhouse
- Complex Slaughterhouse
- Low Processing Packinghouse
- High Processing Packinghouse
- Small Processor
- Meat Cutter
- Sausage and Luncheon Meats Processor
- Ham Processor
- Canned Meats Processor
- Renderer

TABLE 3

Pollutants Regulated	Pollutants Considered in Calculation
BOD5	BOD5
BOD5 and TSS	BOD5 and TSS
BOD5, Oil and Grease	BOD5
TSS	TSS
TSS, Oil and Grease	TSS, Oil and Grease
BOD5, COD, TSS	BOD5, TSS
COD	COD
Oil and Grease	Oil and Grease

TABLE 4

INDUSTRY Subcategory	(CFR Part)	(1) BCT=BAT	(2) BAT unreasonable, BAT suspended	(3) Insufficient data, BAT suspended	(4) Judicial remand, BAT suspended	(5) BAT analysis not required, no action
DAIRY						
1. Recieving Stations	(405.13)	x				
2. Fluid Prod.	(405.23)	x				
3. Cultured Prod.	(405.33)	x				
4. Butter	(405.43)	x				
5. Cottage, Cream Cheese	(405.53)	x				
6. Natural, Proc. Cheese	(405.63)	x				
7. Fluid Mix Ice Cream	(405.73)	x				
8. Ice Cream, Frozen Desserts	(405.83)	x				
9. Condensed Milk	(405.93)	x				
10. Dry Milk	(405.103)	x				
11. Condensed Whey	(405.113)	x				
12. Dry Whey	(405.123)	x				

TABLE 4 (cont'd)

INDUSTRY Subcategory	(CFR Part)	(1) BCT=BAT	(2) BAT unreasonable, BAT suspended	(3) Insufficient data, BAT suspended	(4) Judicial remand, BAT suspended	(5) BAT analysis not required, no action
GRAIN MILLS						
13. Corn Wet	(406.13)	x				
14. Corn Dry	(406.23)	x				
15. Bulgar Wheat	(406.43)		x			
16. Parboiled Rice	(406.83)	x				
17. Ready-to-eat	(406.93)	x				
18. Wheat Starch and Gluten	(406.103)	x				
CANNED AND PRESERVED FRUITS & VEGETABLE						
19. Apple Juice	(407.13)	x				
20. Apple Products	(407.23)	x*	x*			
21. Citrus Products	(407.33)	x				
22. Frozen Potato	(407.43)	x				
23. Dehydrated Potato	(407.53)	x				
24. Canned & Pres. Fruits	(407.63)		x			

TABLE 4 (cont'd)

INDUSTRY Subcategory	(CFR Part)	(1) BCT=BAT	(2) BAT unreasonable, BAT suspended	(3) Insufficient data, BAT suspended	(4) Judicial remand, BAT suspended	(5) BAT analysis not required, no action
25. Canned & Pres. Vegetables**	(407.73)		x			
26. Canned & Misc. Specialities	(407.83)		x			
CANNED AND PRESERVED SEAFOODS						
27. Farm Raised Catfish	(408.13)			x		
28. Conv. Blue Crab	(408.23)			x		
29. Mech. Blue Crab	(408.33)			x		
30. Non-Remote Alaskan Crab	(408.43)			x		
31. Remote Alaskan Crab	(408.53)			x		
32. Non-Remote Alaskan Whole Crab	(408.63)			x		
33. Remote Alaskan Whole Crab	(408.73)			x		

TABLE 4 (cont'd)

INDUSTRY Subcategory	(CFR Part)	(1) BCT=BAT	(2) BAT unreasonable BAT suspended	(3) Insufficient data, BAT suspended	(4) Judicial remand, BAT suspended	(5) BAT analysis not required, no action
34. Dungeness and Tanner Crab	(408.83)			x		
35. Non-Remote Alaskan Shrimp	(408.93)			x		
36. Remote Alaskan Shrimp	(407.103			x		
37. Northern Shrimp	(408.113)			x		
38. Southern Non-Breaded Shrimp	(408.123)			x		
39. Breaded Shrimp	(408.133)			x		
40. Tuna	(408.143)			x		
41. Fish Meal	(408.153)	x				
42. West Coast Butchered Salmon	(408.183)	x				
43. West Coast Mech. Salmon	(408.193)	x				

TABLE 4 (cont'd)

INDUSTRY Subcategory	(CFR Part)	(1) BCT=BAT	(2) BAT unreasonable, BAT suspended	(3) Insufficient data, BAT suspended	(4) Judicial remand, BAT suspended	(5) BAT analysis not required, no action
44. Non-Alaskan Conv. Bottom Fish	(407.213)	x				
45. Non-Alaskan Mech. Bottom Fish	(408.233)	x				
46. Hand-Shucked Clam	(408.243)	x				
47. Mech. Clam	(408.253)	x				
48. Pacific Hand-Shucked Oyster	(408.263)	x				
49. Atlantic & Gulf Hand-Shucked Oyster	(408.273)	x				
50. Steamed & Canned	(408.283)	x				
51. Sardine	(408.293)	x				
52. Non-Alaskan Scallop	(408.303)	x				
53. Non-Alaskan Herring Fillet	(408.323)	x				

TABLE 4 (cont'd)

INDUSTRY SUBCATEGORY	(CFR Part)	(1) BCT=BAT	(2) BAT unreasonable, BAT suspended	(3) Insufficient data, BAT suspended	(4) Judicial remand, BAT suspended	(5) BAT analysis not required, no action
54. Abalone Proc.	(408.333)	x				
SUGAR PROCESSING						
55. Beet Sugar	(409.13)	x				
56. Crystalline Cane Sugar	(409.23)	x***	x***			
57. Liquid Cane Sugar	(409.33)	x				
CEMENT						
58. Leaching	(411.13)		x			
FEEDLOTS						
59. Ducks	(412.23)	x				
FERROALLOYS						
60. Open Electric Furnaces Wet	(424.13)	x				
61. Covered Electric & Smelting Wet	(424.23)	x				
62. Slag Proc.	(424.33)	x				

TABLE 4 (cont'd)

INDUSTRY Subcategory	(CFR Part)	(1) BCT=BAT	(2) BAT unreasonable, BAT suspended	(3) Insufficient data, BAT suspended	(4) Judicial remand, BAT suspended	(5) BAT analysis not required no action
63. Covered Calcium Carbide Wet	(424.43)		x			
64. Elect. Manganese	(424.63)		x			
65. Elect. Chromium	(424.73)		x			
GLASS						
66. Ins. Fiberglass	(426.13)	x				
67. Plate	(426.43)	x				
68. Float	(426.53)		x			
69. Auto Tempering	(426.63)		x			
70. Auto Laminating	(426.73)		x			
71. Container	(426.83)		x			
72. Tubing	(426.103)		x			
73. TV Picture Tube	(426.113)		x			
74. Incandescent	(426.123)		x			
75. Hand Pressed & Blown	(426.133)		x			

TABLE 4 (cont'd)

INDUSTRY Subcategory	(CFR Part)	(1) BCT=BAT	(2) BAT unreasonable, BAT suspended	(3) Insufficient data, BAT suspended	(4) Judicial remand, BAT suspended	(5) BAT analysis not required, no action
ASBESTOS						
76. Cement Pipe	(427.13)					x
77. Cement Sheet	(427.23)					x
78. Paper (Starch Binder)	(427.33)					x
79. Paper (Elastomeric Binder)	(427.43)					x
80. Roofing	(427.63)					x
81. Floor Tile	(427.73)					x
82. Wet Dust Col.	(427.113)					x
MEAT PRODUCTS						
83. Simple Slaughterhouse	(432.13)				x	
84. Complex Slaughterhouse	(432.23)				x	
85. Low Proc. Packinghouse	(432.33)				x	
86. High Proc. Packinghouse	(432.43)				x	
87. Sm[illegible] Proc.	(432.53)	x				

TABLE 4 (cont'd)

INDUSTRY Subcategory	(CFR Part)	(1) BCT=BAT	(2) BAT unreasonable, BAT suspended	(3) Insufficient data, BAT suspended	(4) Judicial remand, BAT suspended	(5) BAT analysis not required, no action
88. Meat Cutter	(432.63)	x				
89. Sausage and Luncheon	(432.73)	x				
90. Ham Proc.	(432.83)	x				
91. Canned Meats	(432.93)	x				
92. Renderers	(432.103)	x				
PHOSPHATES						
93. Sodium Phosphates	(422.63)	x				

COLUMN EXPLANATIONS

(1) BAT control of conventional pollutants has been determined to be reasonable. The Agency is proposing that BCT be equal to the BAT control of conventional pollutants. The Agency is also proposing that BAT control of conventional pollutants be withdrawn.

(2) The BAT control of conventional pollutants (except for pH) has been determined to be unreasonable. The Agency is proposing that the BAT control of conventional pollutants except for pH be withdrawn until such time that BCT standards can be developed. The Agency is also proposing that the BCT control of pH be equal to the BAT control.

(3) Sufficient data to determine reasonableness is not available. The Agency is proposing that the BAT control of conventional pollutants (except pH) be withdrawn. The Agency is proposing that the BCT control of pH be equal to the BAT control.

(4) The BAT regulations for these subcategories are currently under judicial review. Consequently, the Agency is suspending the BAT control of conventional pollutants (except pH). The Agency is proposing that the BCT control of pH be equal to the BAT control.

(5) These BAT regulations were removed from the review because it was determined that the BAT limitation of zero discharge controlled toxic pollutants, not conventional pollutants.

* Apple Products - small plants (processing under 10 tons per day) were found to be unreasonable. Large plants (over 100 tons per day) were found reasonable. The proposed subcategory regulation has been rewritten to cover only those plants processing over 100 tons per day. Comments are invited on this size cutoff.

**BAT limitations for mushrooms and tomatoes are being proposed as BCT, while regulations for all other products in these subcategories are determined to be unreasonable.

***Crystalline Cane Sugar - small plants (processing less than 600 tons per day) were found to be unreasonable. Large plants (over 2100 tons per day) were found to be reasonable. The proposed subcategory regulation has been rewritten to cover only those plants processing over 2100 tons per day. Comments are invited on this size cutoff.

40 CFR Subchapter N Part 405 for the Dairy Products Processing Industry Point Source Category is proposed to be amended as follows:

1.(a) The sections listed below are redesignated as follows and the original section numbers reserved for future use.

Subcategory	Original Section Designation	Revised Section Designation
Receiving Stations	40 CFR 405.13	40 CFR 405.17
Fluid Products	405.23	405.27
Cultured Products	405.33	405.37
Butter	405.43	405.47
Cottage, Cream cheese	405.53	405.57
Natural, Processed Cheese	405.63	405.67
Fluid Mix Ice Cream	405.73	405.77
Ice Cream, Frozen Desserts, Novelties and other Dairy Desserts	405.83	405.87
Condensed Milk	405.93	405.97
Dry Milk	405.103	405.107
Condensed Whey	405.113	405.117
Dry Whey	405.123	405.127

(b) The title and first paragraph of the sections redesignated above are amended to read as follows:

Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology.

The following limitations establish the quantity or quality of pollutants or pollutant properties controlled by this section, which may be discharged by a point source subject to the provisions of this subpart after application of the best conventional pollutant control technology.

* * * * *

40 CFR Subchapter N Part 406 for the Grain Mills Point Source Category is proposed to be amended as follows:

1.(a) The sections listed below are redesignated as follows and the original section numbers reserved for future use.

Subcategory	Original Section Designation	Revised Section Designation
Corn Wet Milling	40 CFR 406.13	40 CFR 406.17
Corn Dry Milling	406.23	406.27
Parboiled Rice Processing	406.63	406.67
Ready to Eat Cereal	406.93	406.97
Wheat Starch and Gluten	406.103	406.107

(b) The title and first paragraph of the sections redesignated above are amended to read as follows:

Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology.

The following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, which may be discharged by a point source subject to the provisions of this subpart after application of the best conventional pollutant control technology.

* * * * *

2. The new sections listed below are added as follows:

Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology.

The following limitations establish the quantity or quality of pollutants or pollutant properties, which may be discharged by a point source subject to the provisions of this subpart after application of the best conventional pollutant control technology: There shall be no discharge of process waste water pollutants to navigable waters.

Subcategory	Section Designation
Normal Wheat Flour Milling	40 CFR 406.37
Normal Rice Milling	406.57
Animal Feed	406.77
Hot Cereal	406.87

3. The following section is withdrawn and the

section number reserved for future use.

Bulgar Wheat Flour Milling	40 CFR 406.43

4. A new section 406.47 for the Bulgar Wheat Flour Milling Subcategory is added as follows:

Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology.

The following limitations establish the quantity or quality of pollutants or pollutant properties controlled by this section, which may be discharged by a point source subject to the provisions of this subpart after application of the best conventional pollutant control technology.

Effluent characteristic	Effluent limitations
pH	Within the range 6.0 to 9.0.

40 CFR Subchapter N Part 407 for the Canned and Preserved Fruits and Vegetables Processing Point Source Category is proposed to be amended as follows:

1. The sections listed below are withdrawn and the section numbers reserved for future use.

Subcategory	Section Designation
Apple Products	40 CFR 407.23
Canned & Preserved Fruits	407.63
Canned & Preserved Vegetables	407.73
Canned & Miscellaneous Specialties	407.83

2.(a) The sections listed below are redesignated as follows and the original section numbers reserved for future use.

Subcategory	Original Section Designation	Revised Section Designation
Apple Juice	40 CFR 407.13	40 CFR 407.17
Citrus Products	407.33	407.37
Frozen Potato Products	407.43	407.47

(b) The title and first paragraph of the sections redesignated above are amended to read as follows:

Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology.

The following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, which may be discharged by a point source subject to the provisions of this subpart after application of the best conventional pollutant control technology.

* * * * *

3. A new section 407.27 is added to the Apple Products Subcategory and reads as follows:

§ 407.27 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology.

(a) The following limitations apply to plants producing more than 100 tons per day of final product and establish the quantity or quality of pollutants or pollutant properties, which may be discharged by a point source subject to the provisions of this subpart after application of the best conventional pollutant control technology:

Effluent characteristics	Effluent limitations: Maximum for any 1 day	Average of daily values for 30 consecutive days shall not exceed
	Metric units (kilograms per 1,000 kg of raw material)	
BOD_5	0.20	0.10
TSS	.20	.10
pH	Within the range 6.0 to 9.0	

English units (pounds per 1,000

lb of raw material)

BOD5	0.20	0.10
TSS	.20	.10
pH	Within the range 6.0 to 9.0	

(b) Reserved

4. A new section 407.67 is added to the Canned and Preserved Fruits Subcategory and reads as follows:

§ 407.67 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology.

(a) The following limitations establish the quantity of BOD5 controlled by this section, which may be discharged by an existing point source subject to the provisions of this subpart after application of the best conventional pollutant control technology. Any fruit processing plant which continuously or intermittently discharges process waste water during the processing season shall meet the annual average, maximum thirty day average, and maximum day BOD5 limitations. Fruit processing plants employing long term waste stabilization, where all or a portion of the process waste water discharge is stored for the entire processing season and released at a controlled rate with state approval, shall meet only the annual average BOD5 limitations.

(Metric units, kg/kkg of raw material;
English units, lb/1,000 lb of raw material)

	BOD5 effluent limitations		
Commodity (fruits)	Maximum for any 1 day	Average of daily values for 30 consecutive days shall not exceed	Annual average shall not exceed
Tomatoes:			
Medium	0.524	0.378	0.173
Large	0.524	0.378	0.173

(b) The following limitations establish the quantity of TSS controlled by this section, which may be discharged by an existing point source subject to the provisions of this subpart after application of the best conventional pollutant control technology. Any fruit processing plant which continuously or intermittently discharges process waste water during the processing season shall meet the annual average, maximum thirty day average, and maximum day TSS limitations. Fruit processing plants employing long term waste stabilization, where all or a portion of the process waste water discharge is stored for the entire processing season and released at a controlled rate with state approval, shall meet only the annual average TSS limitations.

(Metric units, kg/kkg of raw material;
English units, lb/1,000 lb of raw material)

	TSS effluent limitations		
Commodity (fruits)	Maximum for any 1 day	Average of daily values for 30 consecutive days shall not exceed	Annual average shall not exceed
Tomatoes:			
Medium	0.933	0.495	0.349
Large	0.524	0.378	0.173

(c) The following limitations establish the quality of pH controlled by this section, which may be discharged by a "medium" or "large" existing point source subject to the provisions of this subpart after application of the best conventional pollutant control technology.

Effluent characteristic	Effluent limitations
pH	At all times within the range 6.0 to 9.5.

5. A new section 407.77 is added to the Canned and Preserved Vegetables Subcategory and reads as follows:

§ 407.77 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology.

(a) The following effluent limitations establish the quantity of BOD_5 controlled by this section, which may be discharged by an existing point source subject to the provisions of this subpart after application of the best conventional pollutant control technology. Any vegetable processing plant which continuously or intermittently discharges process waste water during the processing season shall meet the annual average, maximum thirty day average, and maximum day BOD_5 limitations. Vegetable processing plants employing long term waste stabilization, where all or a portion of the process waste water discharge is stored for the entire processing season and released at a controlled rate with state approval, shall meet only the annual average BOD_5 limitations. The effluent limitations do not apply to single-commodity 100 percent canned corn processing plants of all sizes, and multi-commodity 100 percent frozen vegetable processing plants with total annual raw material production less than 7,264 kkg (8,000 tons) per year.

(Metric units, kg/kkg of raw material;
English units, lb/1,000 lb of raw material)

	BOD5 effluent limitations		
Commodity (vegetables)	Maximum for any 1 day	Average of daily values for 30 consecutive days shall not exceed	Annual average shall not exceed
Mushrooms:			
Medium	1.188	0.862	0.406
Large	1.188	0.862	0.406

(b) The following limitations establish the quantity of TSS controlled by this section, which may be

discharged by any existing point source subject to the provisions of this subpart after application of the best conventional pollutant control technology. Any vegetable processing plant which continuously or intermittently discharges process waste water during the processing season shall meet the annual average, maximum thirty day average, and maximum day TSS limitations. Vegetable processing plants employing long term waste stabilization, where all or a portion of the process waste water discharge is stored for the entire processing season and released at a controlled rate with state approval, shall meet only the annual average TSS limitations. The effluent limitations do not apply to single-commodity 100 percent canned corn processing plants of all sizes, and multi-commodity 100 percent frozen vegetable processing plants with total annual raw material production less than 7,264 kkg (8,000 tons) per year.

(Metric units, kg/kkg of raw material;
English units, lb/1,000 lb of raw material)

	TSS effluent limitations		
Commodity (vegetables)	Maximum for any 1 day	Average of daily values for 30 consecutive days shall not exceed	Annual average shall not exceed
Mushrooms:			
Medium	2.122	1.146	0.820
Large	1.188	0.862	0.406

(c) The following limitations establish the quality of pH controlled by this section, which may be discharged by a "medium" or "large" existing point source subject to the provisions of this subpart after application of the best conventional pollutant control technology. The effluent limitations do not apply to single-commodity 100 percent canned corn processing plants of all sizes, and multi-commodity 100 percent frozen vegetable processing plants with total annual raw material production less than 7,264 kkg (8,000 tons) per year.

Effluent

characteristic	Effluent limitations
pH	At all times within the range 6.0 to 9.5.

6. A new section 407.87 is added to the Canned and Miscellaneous Specialties Subcategory and reads as follows

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

(b) Reserved

(c) the following limitations establish the quality of pH controlled by this section, which may be discharged by a "medium" or "large" existing point source subject to the provisions of this subpart.

Effluent characteristic	Effluent limitations
pH	At all times within the range 6.0 to 9.5.

40 CFR Subchapter N Part 408 for the Canned and Preserved Seafood Processing Point Source Category is proposed to be amended as follows:

1. The sections listed below are withdrawn, and the section numbers reserved for future use.

Subcategory	Section Designation
Farm Raised Catfish Processing	40 CFR 408.13
Conventional Blue Crab Processing	408.23
Mechanized Blue Crab Processing	408.33
Non-Remote Alaskan Crab Meat Processing	408.43
Remote Alaskan Crab Meat Processing	408.53
Non-Remote Alaskan Whole Crab and Crab Section Processing	408.63
Remote Alaskan Whole Crab and Crab Section Processing	408.73
Dungeness and Tanner Crab Processing in the Contiguous States	408.83
Non-Remote Alaskan Shrimp Processing	408.93
Remote Alaskan Shrimp Processing	408.103
Northern Shrimp Processing in the Contiguous States	408.113
Southern Non-Breaded Shrimp Processing in the Contiguous States	408.123

Breaded Shrimp Processing in the Contiguous States	408.133
Tuna Processing	408.143

2. The new sections listed below are added as follows:

Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology.

The following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, which may be discharged by a point source subject to the provisions of this subpart after application of the best conventional pollutant control technology.

Effluent characteristic	Effluent limitations
pH	Within the range 6.0 to 9.0.

Subcategory	Section Designation
Farm Raised Catfish Processing	408.17
Conventional Blue Crab Processing	408.27
Mechanized Blue Crab Processing	408.37
Non-Remote Alaskan Crab Meat Processing	408.47
Remote Alaskan Crab Meat Processing	408.57
Non-Remote Alaskan Whole Crab and Crab Section Processing	408.67
Remote Alaskan Whole Crab and Crab Section Processing	408.77
Dungeness and Tanner Crab Processing in the Contiguous States	408.87
Non-Remote Alaskan Shrimp Processing	408.97
Remote Alaskan Shrimp Processing	408.107
Northern Shrimp Processing in the Contiguous States	408.117
Southern Non-Breaded Shrimp Processing in the Contiguous States	408.127
Breaded Shrimp Processing in the Contiguous States	408.137

Tuna Processing	408.147

3.(a) The sections listed below are redesignated as follows and the original section numbers reserved for future use.

Subcategory	Original Section Designation	Revised Section Designation
Fish Meal Processing	40 CFR 408.153	40 CFR 408.157
West Coast Hand-Butchered Salmon Processing	408.183	408.187
West Coast Mechanized Salmon Processing	408.193	408.197
Non-Alaskan Conventional Bottom Fish Processing	408.213	408.217
Non-Alaskan Mechanized Bottom Fish Processing	408.223	408.227
Hand-Shucked Clams Processing	408.233	408.237
Mechanized Clam Processing	408.243	408.247
Pacific Coast Hand-Shucked Oyster Processing	408.253	408.257
Atlantic & Gulf Hand-Shucked Oyster Processing	408.263	408.267
Steamed and Canned Oyster Processing	408.273	408.277
Sardine Processing	408.283	408.287
Non-Alaskan Scallop Processing	408.303	408.307
Non-Alaskan Herring Fillet Processing	408.323	408.327
Abalone Processing	408.333	408.337

(b) The title and first paragraph of the sections redesignated above are amended to read as follows:

Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology.

The following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, which may be discharged by a point source subject to the provisions of this subpart after application of the best conventional pollutant control technology.

* * * * *

40 CFR Subchapter N Part 409 for the Sugar Processing Point Source Category is proposed to be amended as follows:

1. (a) Section 409.23 of the Crystalline Cane Sugar Refining Subcategory is withdrawn and the section number is reserved for future use.

(b) A new section 409.27 is added to the Crystalline Cane Sugar Refining Subcategory and reads as follows:

§ 409.27 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology.

The following limitations apply only to those plants processing 2100 tons per day of melt or over and establish the quantity or quality of pollutants or pollutant properties, controlled by this section, which may be discharged by a point source subject to the provisions of this subpart after application of the best conventional pollutant control technology.

Effluent characteristics	Effluent limitations: Maximum for any 1 day	Effluent limitations: Average of daily values for 30 consecutive days shall not exceed
	Metric units (kilograms per 1,000 kg of melt)	
BOD_5	0.18	0.09
TSS	.11	.035
pH	Within the range of 6.0 to 9.0.	
	English units (pounds per ton of melt)	
BOD_5	0.36	0.18
TSS	.21	.07
pH	Within the range of 6.0 to 9.0.	

2.(a) The sections listed below are redesignated as follows and the original section numbers reserved for future use.

Subcategory	Original Section Designation	Revised Section Designation
Liquid Cane Sugar Refining	409.33	409.37

(b) The title and first paragraph of the sections redesignated above are amended to read as follows:

Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology.

The following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, which may be discharged by a point source subject to the provisions of this subpart after application of the best conventional pollutant control technology.

* * * * *

3.(a) The following section 409.13 of the Beet Sugar Processing Subcategory is amended to read as follows:

(a) * * * *

(1) The following limitations establish the maximum permissible discharge of process waste water pollutants when the process waste water discharge results from barometric condensing operations only.

Effluent characteristics	Effluent limitations
Temperature	Temperature not to exceed the temperature of cooled water acceptable for return to the heat producing process and in no event greater than 32°C (90°F).

(2) The following limitations establish the maximum permissible discharge of process waste water pollutants when the process waste water discharge results, in

whole or in part, from barometric condensing operations and any other beet sugar processing operation.

Effluent characteristics	Effluent limitations
Temperature	Not to exceed 32°C (90°F).

4. A new section 409.17 is added to the Beet Sugar Processing Subcategory and reads as follows:

§ 409.17 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology.

(a) The following limitations establish the quantity or quality of pollutants or pollutant properties which may be discharged by a point source where the sugar beet processing capacity of the point source does not exceed 1,090 kkg (2,300 tons) per day of beets sliced or where the soil filtration rate, whether natural or by deliberate design, within the boundaries of all waste water treatment or retention facilities associated with the point source is less than or equal to 0.159 cm (1/16 in.) per day; provided, however, that a discharge by a point source may be made in accordance with the limitations set forth in either paragraph (a)(1) exclusively, or paragraph (a)(2) of this section exclusively.

(1) The following limitations establish the maximum permissible discharge of process waste water pollutants when the process waste water discharge results from barometric condensing operations only.

Effluent characteristics	Effluent limitations: Maximum for any 1 day	Effluent limitations: Average of daily values for 30 consecutive days shall not exceed
	Metric units (kg/kkg of product)	
BOD_5	2.0	1.3
pH	Within the range of 6.0 to 9.0.	

English units (lb/1,000 lb of product)

BOD5	2.0	1.3
pH	Within the range of 6.0 to 9.0.	

(2) The following limitations establish the maximum permissible discharge of process waste water pollutants when the process waste water discharge results, in whole or in part, from barometric condensing operations and any other beet sugar processing operation.

Effluent characteristics	Effluent limitations	
	Maximum for any 1 day	Average of daily values for 30 consecutive days shall not exceed
Metric units (kg/kkg of product)		
BOD5	2.0	1.3
TSS	2.0	1.3
pH	Within the range of 6.0 to 9.0.	
Fecal coliform	Not to exceed MPN of 400/100 ml at any time.	
English units (lb/1,000 lb of product)		
BOD5	2.0	1.3
TSS	2.0	1.3
pH	Within the range of 6.0 to 9.0.	
Fecal coliform	Not to exceed MPN of 400/100 ml at any time (not typically expressed in English units).	

(b) The following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this regulation, which may be discharged by a point source in all instances not specified under the provisions of paragraph (a) of this section: There shall be no discharge of process waste water pollutants to navigable waters.

40 CFR Subchapter N Part 411 for the Cement Manufacturing Point Source Category is proposed to be amended as follows:

1. Section 411.13 of the Nonleaching Subcategory and Section 411.23 of the Leaching Subcategory are amended to read as follows:

   Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable.

The following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, which may be discharged by a point source subject to the provisions of this subpart after application of the best available technology economically achievable.

Effluent characteristics	Effluent limitations (maximum for any 1 day)
Temperature (heat)	Not to exceed 3°C rise above inlet temperature.

2. A new section 411.17 is added for the Nonleaching Subcategory and reads as follows:

§ 411.17 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology.

The following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, which may be discharged by a point source subject to the provisions of this subpart after application of the best conventional pollutant control technology.

Effluent characteristics	Effluent limitations (Maximum for any 1 day)
	Metric units (kg/kkg of product)
TSS	0.005

pH	Within the range 6.0 to 9.0.

	English units (lb/1,000 lbs of product)
TSS	0.005
pH	Within the range 6.0 to 9.0.

3. A new section 411.27 for the Leaching Subcategory is added as follows:

§ 411.27 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology.

The following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, which may be discharged by a point source subject to the provisions of this subpart after application of the best conventional pollutant control technology.

Effluent characteristic	Effluent limitations
pH	Within the range 6.0 to 9.0.

4.(a) The section listed below is redesignated as follows and the original section number reserved for future use.

Subcategory	Original Section Designation	Revised Section Designation
Materials Storage Piles Runoff	411.33	411.37

(b) The title and first paragraph of the sections redesignated above are amended to read as follows:

Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology.

The following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, which may be discharged by a point source subject to the provisions of this subpart after application of the best conventional pollutant control technology.

* * * * *

40 CFR Subchapter N Part 412 for the Feedlots Point Source Category is proposed to be amended as follows:

1. The sections listed below are added as reads below.

Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology.

(a) Subject to the provisions of paragraph (b) of this section, the following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, which may be discharged by a point source subject to the provisions of this subpart after application of the best conventional pollutant control technology. There shall be no discharge of process waste water pollutants to navigable waters.

(b) Process waste pollutants in the overflow may be discharged to navigable waters whenever rainfall events, either chronic or catastrophic, cause an overflow of process waste water from a facility designed, constructed and operated to contain all process generated waste waters plus the runoff from a 25 year, 24 hour rainfall event for the location of the point source.

Subcategory	Section Designation
All Subcategories Except Ducks	412.17
Ducks	412.27

40 CFR Subchapter N Part 418 for the Fertilizer Manufacturing Point Source Category is proposed to be amended as follows:

1. Section 418.13 of the Phosphate Subcategory is proposed to be amended as follows:

§ 418.13 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable.

* * * * *

(c) The concentration of pollutants discharged in process wastewater pursuant to the limitations of paragraph (b) of this section shall not exceed the values listed in the following table:

Effluent characteristics	Effluent limitations (mg/l) Maximum for any 1 day	Average of daily values for 30 consecutive days shall not exceed
Fluoride	75	25

The total suspended solid limitations set forth in this paragraph shall be waived for process wastewater from a calcium sulfate storage pile runoff facility, operated separately or in combination with a water recirculation system, which is chemically treated and then clarified or settled to meet the other pollutant limitations set forth in this paragraph.

(d) The concentration of pollutants discharged in contaminated non-process wastewater shall not exceed the values listed in the following table:

Effluent characteristics	Effluent limitations (mg/l) Maximum for any 1 day	Average of daily values for 30 consecutive days shall not exceed
Fluoride	75	25

2. A new section 418.17 for the Phosphate Subcategory is added as follows:

§ 418.17 Effluent limitations and guidelines representing the degree of effluent reduction attained by the application of the best conventional pollutant control technology.

The following limitations establish the quantity or quality of pollutants or pollutant properties which may be discharged by a point source subject to the provisions of this subpart after application of the best conventional pollutant control technology:

(a) Subject to the provision of paragraphs (b) and (c) of this section, the following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, which may be discharged by a point source subject to the provisions of this subpart after application of the best conventional pollutant control technology: There shall be no discharge of process wastewater pollutants to navigable waters.

(b) Process wastewater pollutants from a calcium sulfate storage pile runoff facility operated separately or in combination with a water recirculation system designed, constructed and operated to maintain a surge capacity equal to the runoff from the 25-year, 24-hour rainfall event may be discharged, after treatment to the standards set forth in paragraph (c) of this section, whenever chronic or catastrophic precipitation events cause the water level to rise into the surge capacity. Process wastewater must be treated and discharged whenever the water level equals or exceeds the midpoint of the surge capacity.

(c) The concentration of pollutants discharged in process wastewater pursuant to the limitations of paragraph (b) of this section shall not exceed the values listed in the following table:

Effluent characteristics	Effluent limitations (mg/l)	
	Maximum for any 1 day	Average of daily values for 30 consecutive days shall not exceed
Total phosphorus (as P)	105	35
TSS	150	50

The total suspended solid limitations set forth in this paragraph shall be waived for process wastewater from a calcium sulfate storage pile runoff facility, operated separately or in combination with a water recirculation system, which is chemically treated and then clarified or settled to meet the other pollutant limitations set forth in this paragraph.

(d) The concentration of pollutants discharged in contaminated non-process wastewater shall not exceed the values listed in the following table:

Effluent characteristics	Effluent limitations (mg/l)	
	Maximum for any 1 day	Average of daily values for 30 consecutive days shall not exceed
Total phosphorus (as P)	105	35

3. A new section 418.27 for the Ammonia Subcategory is added as follows:

§ 418.27 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology.

The following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, which may be discharged by a point source subject to the provisions of this subpart after application of the best conventional pollutant control technology.

Effluent characteristic	Effluent limitations
pH	Within the range 6.0 to 9.0.

4. The sections listed below are added as follows:

Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology.

The following limitations establish the quantity or quality of pollutants or pollutant properties, which may be discharged by a point source subject to the provisions of this subpart after application of the best conventional pollutant control technology: There shall be no discharge of process waste water pollutants to navigable waters.

Subcategory	Section Designation
Ammonium Sulfate Production	418.67
Mixed and Blend Fertilizer Production	418.77

40 CFR Subchapter N Part 422 for the Phosphate Manufacturing Point Source Category is proposed to be amended as follows:

1. Section 422.43 of the Defluorinated Phosphate Rock Subcategory is proposed to be amended as follows:

§ 422.43 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable.

* * * * *

(c) The concentration of pollutants discharged in process waste water pursuant to the limitations of paragraph (b) of this section shall not exceed the values listed in the following table:

(Milligrams per liter)

Effluent characteristics	Effluent limitations: Maximum for any 1 day	Effluent limitations: Average of daily values for 30 consecutive days shall not exceed
Fluoride (as F)	75	25

(d) The concentration of pollutants discharged in contaminated non-process wastewater shall not exceed the values listed in the following table:

Effluent limitations (mg/l)

Effluent characteristics	Maximum for any 1 day	Average of daily values for 30 consecutive days shall not exceed
Fluoride	75	25

2. A new section 422.47 for the Defluorinated Phosphate Rock Subcategory is added as follows:

§ 422.47 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology.

The following limitations establish the quantity or quality of pollutants or pollutant properties, which may be discharged by a point source subject to the provisions of this subpart after application of the best conventional pollutant control technology:

(a) Subject to the provisions of paragraphs (b), (c) and (d) of this section, the following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, which may be discharged by a point source subject to the provisions of this subpart after application of the best conventional pollutant control technology: There shall be no discharge of process waste water pollutants to navigable waters.

(b) Process waste water pollutants from a cooling water recirculation system designed, constructed and operated to maintain a surge capacity equal to the runoff from the 25-year, 24-hour rainfall event may be discharged, after treatment to the standards set forth in paragraph (c) of this section, whenever chronic or catastrophic precipitation events cause the water level in the pond to rise into the surge capacity. Process waste water must be treated and discharged whenever the water level equals or exceeds the mid-point of the surge capacity.

(c) The concentration of pollutants discharged in process waste water pursuant to the limitations of paragraph (b) of this section shall not exceed the values listed in the following table:

(Milligrams per liter)

Effluent characteristics	Effluent limitations	
	Maximum for any 1 day	Average of daily values for 30 consecutive days shall not exceed
Total phosphorus (as P)	105	35
TSS	150	50
pH	Within the range 6.0 to 9.5.	

The total suspended solid limitation set forth in this paragraph shall be waived for process waste water from a calcium sulfate storage pile runoff facility, operated separately or in combination with a water recirculation system, which is chemically treated and then clarified or settled to meet the other pollutant limitations set forth in this paragraph.

(d) The concentration of pollutants discharged in contaminated non-process waste water shall not exceed the values listed in the following table:

(Milligrams per liter)

Effluent characteristics	Effluent limitations	
	Maximum for any 1 day	Average of daily values for 30 consecutive days shall not exceed
Total phosphorus (as P)	105	35
pH	Within the range 6.0 to 9.5.	

3. Section 422.53 of the Defluorinated Phosphoric Acid Subcategory is proposed to be amended as follows:

§ 422.53 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable.

* * * * *

(c) The concentration of pollutants discharged in process waste water pursuant to the limitations of

paragraph (b) of this section shall not exceed the values listed in the following table:

(Milligrams per liter)

Effluent characteristics	Effluent limitations	
	Maximum for any 1 day	Average of daily values for 30 consecutive days shall not exceed
Fluoride (as F)	75	25

(d) The concentration of pollutants discharged in contaminated non-process wastewater shall not exceed the values listed in the following table:

(Milligrams per liter)

Effluent characteristics	Effluent limitations	
	Maximum for any 1 day	Average of daily values for 30 consecutive days shall not exceed
Fluoride (as F)	75	25

4. A new section 422.57 for the Defluorinated Phosphoric Acid Subcategory is added as follows:

§ 422.57 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology.

The following limitations establish the quantity or quality of pollutants or pollutant properties, which may be discharged by a point source subject to the provisions of this subpart after application of the best conventional pollutant control technology:

(a) Subject to the provisions of paragraphs (b), (c) and (d) of this section, the following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, which may be discharged by a point source subject to the provisions of this subpart after application of the best conventional pollutant control technology: There shall be no discharge of process waste water pollutants to navigable waters.

(b) Process waste water pollutants from a cooling water recirculation system designed, constructed and operated to maintain a surge capacity equal to the runoff from the 25-year, 24-hour rainfall event may be discharged, after treatment to the standards set forth in paragraph (c) of this section, whenever chronic or catastrophic precipitation events cause the water level in the pond to rise into the surge capacity. Process waste water must be treated and discharged whenever the water level equals or exceeds the mid-point of the surge capacity.

(c) The concentration of pollutants discharged in process waste water pursuant to the limitations of paragraph (b) of this section shall not exceed the values listed in the following table:

(Milligrams per liter)

Effluent characteristics	Effluent limitations: Maximum for any 1 day	Effluent limitations: Average of daily values for 30 consecutive days shall not exceed
Total phosphorus (as P)	105	35
TSS	150	50
pH	Within the range 6.0 to 9.5.	

The total suspended solid limitation set forth in this paragraph shall be waived for process waste water from a calcium sulfate storage pile runoff facility, operated separately or in combination with a water recirculation system, which is chemically treated and then clarified or settled to meet the other pollutant limitations set forth in this paragraph.

(d) The concentration of pollutants discharged in contaminated non-process waste water shall not exceed the values listed in the following table:

(Milligrams per liter)

Effluent characteristics	Effluent limitations	
	Maximum for any 1 day	Average of daily values for 30 consecutive days shall not exceed
Total phosphorus (as P)	105	35
pH	Within the range 6.0 to 9.5.	

5. Section 422.63 of the Sodium Phosphate Subcategory is proposed to be amended as follows:

§ 422.63 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable.

The following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, which may be discharged by a point source subject to the provisions of this subpart after application of the best available technology economically achievable:

Metric units, kg/kkg of product:
English units, lb/1,000 lb of product

Effluent characteristics	Effluent limitations	
	Maximum for any 1 day	Average of daily values for 30 consecutive days shall not exceed
Fluoride (as F)	0.21	0.11

6. A new Section 422.67 for the Sodium Phosphate Subcategory is added as follows:

§ 422.67 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology.

The following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, which may be discharged by a point source subject to the provisions of this subpart after application of the best conventional pollutant control technology:

Effluent characteristics	Effluent limitations: Maximum for any 1 day	Average of daily values for 30 consecutive days shall not exceed
	(Metric units kg/kkg of finished product: English units, lb/1,000 lb of product)	
TSS	0.35	0.18
Total phosphorus (as P)	0.56	0.28
pH	within the range 6.0 to 9.5	

40 CFR Subchapter N Part 424 for the Ferroalloy Manufacturing Point Source Category is proposed to be amended as follows:

1. Section 424.13 of the Open Electric Furnaces with Wet Air Pollution Control Devices Subcategory is proposed to be amended as follows:

§ 424.13 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable.

The following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, which may be discharged by a point source subject to the provisions of this subpart after application of the best available technology economically achievable:

Effluent characteristics	Effluent limitations: Maximum for any 1 day	Average of daily values for 30 consecutive days shall not exceed
	Metric units kg/Mwh	
Chromium total	.0008	.0004
Chromium VI	.00008	.00004
Manganese total	.008	.0039

2. A new Section 424.17 for the Open Electric Furnaces with Wet Air Pollution Control Devices Subcategory is added as follows:

§ 424.17 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology.

The following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, which may be discharged by a point source subject to the provisions of this subpart after application of the best conventional pollutant control technology:

Effluent characteristics	Effluent limitations: Maximum for any 1 day	Effluent limitations: Average of daily values for 30 consecutive days shall not exceed
	Metric units kg/Mwh	
TSS	0.024	0.012
pH	Within the range 6.0 to 9.0	
	English units lb/Mwh	
TSS	0.052	0.026
pH	Within the range 6.0 to 9.0	

3. Section 424.23 of the Covered Electric Furnaces and Other Smelting Operations with Wet Air Pollution Control Devices Subcategory is proposed to be amended as follows:

§ 424.23 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable.

The following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, which may be discharged by a point source subject to the provisions of this subpart after application of the best available technology economically achievable:

Effluent characteristics	Effluent limitations: Maximum for any 1 day	Average of daily values for 30 consecutive days shall not exceed
	Metric units kg/Mwh	
Chromium total	.001	.0005
Chromium VI	.0001	.00005
Manganese total	.011	.005
Cyanide total	.0005	.0003
Phenols	.0004	.0002
	English units lb/Mwh	
Chromium total	.002	.0012
Chromium VI	.0002	.0001
Manganese total	.023	.012
Cyanide total	.001	.0006
Phenols	.0009	.0005

Provided, however, that for nonelectric furnace smelting processes, the units of effluent limitations set forth in this section shall be read as "kg/kkg of product" rather than "kg/Mwh," and the limitations (except for pH) shall be 3.3 times those listed in the table in this section (or, for English units, "lb/ton of product" rather than "lb/Mwh," and the limitations (except for pH) shall be three times those listed in the table).

4. A new Section 424.27 for the Covered Electric Furnaces and Other Smelting Operations with Wet Air Pollution Control Devices Subcategory is added as follows:

§ 424.27 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology.

The following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, which may be discharged by a point source subject to the provisions of this subpart after application of the best conventional pollutant control technology:

Effluent characteristics	Effluent limitations	
	Maximum for any 1 day	Average of daily values for 30 consecutive days shall not exceed
	Metric units kg/Mwh	
TSS	0.032	0.016
pH	Within the range 6.0 to 9.0	
	English units lb/Mwh	
TSS	0.071	0.035
pH	Within the range 6.0 to 9.0	

Provided, however, that for nonelectric furnace smelting processes, the units of effluent limitations set forth in this section shall be read as "kg/kkg of product" rather than "kg/Mwh," and the limitations (except for pH) shall be 3.3 times those listed in the table in this section (or, for English units, "lb/ton of product" rather than "lb/Mwh," and the limitations (except for pH) shall be three times those listed in the table).

5. Section 424.33 of the Slag Processing Subcategory is proposed to be amended as follows:

§ 424.33 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable.

The following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, which may be discharged by a point source subject to the provisions of this subpart after application of the best available technology economically achievable:

Effluent	Effluent limitations	
	Maximum for any 1 day	Average of daily values for 30 consecutive days

characteristics		shall not exceed
	Metric units kg/kkg processed	
Chromium total	.0054	.0027
Manganese total	.054	.027
	English units lb/ton of raw material	
Chromium total	.011	.0054
Manganese total	.108	.054

6. A new Section 424.37 for the Slag Processing Subcategory is added as follows:

§ 424.37 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology.

The following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, which may be discharged by a point source subject to the provisions of this subpart after application of the best conventional pollutant control technology:

Effluent characteristics	Effluent limitations: Maximum for any 1 day	Effluent limitations: Average of daily values for 30 consecutive days shall not exceed
	Metric units kg/Mwh	
TSS	0.271	0.136
pH	Within the range 6.0 to 9.0	
	English units lb/Mwh	
TSS	0.542	0.271
pH	Within the range 6.0 to 9.0	

7. Section 424.43 of the Covered Calcium Carbide Furnaces with Wet Air Pollution Control Devices Subcategory is proposed to be amended as follows:

§ 424.43 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable.

The following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, which may be discharged by a point source subject to the provisions of this subpart after application of the best available technology economically achievable:

Effluent characteristics	Effluent limitations: Maximum for any 1 day	Effluent limitations: Average of daily values for 30 consecutive days shall not exceed
(Metric units) kg/kkg of product		
Total Cyanide	0.0056	0.0028
(English units) lb/1000 lb of product		
Total Cyanide	0.0056	0.0028

8. A new Section 424.57 for the Other Calcium Carbide Furnaces Subcategory is added as follows:

§ 424.57 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology.

The following limitations establish the quantity or quality of pollutants or pollutant properties, which may be discharged by a point source subject to the provisions of this subpart after application of the best conventional pollutant control technology: There shall be no discharge of process waste water pollutants to navigable waters.

9. Section 424.63 of the Electrolytic Manganese Products Subcategory is proposed to be amended as follows:

§ 424.63 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable.

(a) The following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, which may be discharged by a point source subject to the provisions of this subpart producing electrolytic manganese after application of the best available technology economically achievable:

Effluent characteristics	Effluent limitations: Maximum for any 1 day	Effluent limitations: Average of daily values for 30 consecutive days shall not exceed
	(Metric units) kg/kkg of product	
Manganese	0.678	0.339
Ammonia-N	6.778	3.389
	(English units) lb/1000 lb of product	
Manganese	0.678	0.339
Ammonia-N	6.778	3.389

(b) The following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, which may be discharged by a point source subject to the provisions of this subpart producing electrolytic manganese dioxide after application of the best available technology economically achievable:

Effluent characteristics	Effluent limitations: Maximum for any 1 day	Effluent limitations: Average of daily values for 30 consecutive days shall not exceed
	(Metric units) kg/kkg of product	

Manganese	0.176	0.088
Ammonia-N	1.762	0.881
(English units) lb/1000 lb of product		
Manganese	0.176	0.088
Ammonia-N	1.762	0.881

10. Section 424.73 of the Electrolytic Chromium Subcategory is proposed to be amended as follows:

§ 424.73 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable.

The following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, which may be discharged by a point source subject to the provisions of this subpart after application of the best available technology economically achievable:

Effluent characteristics	Effluent limitations: Maximum for any 1 day	Effluent limitations: Average of daily values for 30 consecutive days shall not exceed
(Metric units) kg/kkg of product		
Manganese	0.530	0.265
Chrominum	0.053	0.027
Ammonia-N	5.297	2.649
(English units) lb/1000 lb of product		
Manganese	0.530	0.265
Chrominum	0.053	0.027
Ammonia-N	5.297	2.649

11. The new sections listed below are added as follows:

Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology.

The following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, which may be discharged by a point source subject to the provisions of this subpart after application of the best conventional pollutant control technology.

Effluent characteristic	Effluent limitations
pH	Within the range 6.0 to 9.0.

Subcategory	Section Designation
Covered Calcium Carbide Furnaces with Wet Air Pollution Control Devices	424.47
Electrolytic Manganese Products	424.67
Electrolytic Chromium	424.77

40 CFR Subchapter N Part 426 for the Glass Manufacturing Point Source Category is proposed to be amended as follows:

1. The sections listed below are added as follows:

Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology.

The following limitations establish the quantity or quality of pollutants or pollutant properties, which may be discharged by a point source subject to the provisions of this subpart after application of the best conventional pollutant control technology: There shall be no discharge of process waste water pollutants to navigable waters.

Subcategory	Section Designation
Insulation Fiberglass	40 CFR 426.17
Sheet Glass	426.27
Rolled Glass Manufacturing	426.37

2.(a) Section 426.43 of the Plate Glass Manufacturing Subcategory is redesignated as Section 426.47 and the original section number reserved for future use.

(b) The title and first paragraph of the section redesignated above is amended to read as follows:

Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology.

The following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, which may be discharged by a point source subject to the provisions of this subpart after application of the best conventional pollutant control technology.

* * * * *

3. The regulations listed below are withdrawn and the section numbers reserved for future use.

Subcategory	Section Designation
Float Glass Manufacturing	40 CFR 426.53
Automotive Glass Tempering	426.63
Automotive Glass Laminating	426.73
Glass Container Manufacturing	426.83
Glass Tubing (Danner) Manufacturing	426.103

4. The regulations listed below are added as follows:

Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology.

The following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, which may be discharged by a point source subject to the provisions of this subpart after application of the best conventional pollutant control technology.

Effluent Characteristic	Effluent Limitation
pH	Within the range 6.0 to 9.0

Subcategory	Section Designation
Float Glass Manufacturing	40 CFR 426.57
Automotive Glass Tempering	426.67
Automotive Glass Laminating	426.77
Glass Container Manufacturing	426.87
Glass Tubing (Danner) Manufacturing	426.107
Television Picture Tube Envelope Manufacturing	426.117
Incandescent Lamp Envelope Manufacturing	426.127
Hand Pressed and Blown Glass Manufacturing	426.137

5. Section 426.113 of the Television Picture Tube Envelope Manufacturing Subcategory is proposed to be amended as follows:

§ 426.113 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable.

The following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, which may be discharged by a point source subject to the provisions of this subpart after application of the best available technology economically achievable. These limitations are applicable to the abrasive polishing and acid polishing waste water streams.

Effluent characteristics	Effluent limitations: Maximum for any 1 day	Effluent limitations: Average of daily values for 30 consecutive days shall not exceed
	(Metric units) g/kkg of furnace pull	
Fluoride	120.0	60.0
Lead	0.9	0.45
	(English units) lb/1000 lb of furnace pull	
Fluoride	0.12	0.06
Lead	0.0009	0.00045

6. Section 426.123 of the Incandescent Lamp Envelope Manufacturing Subcategory is proposed to be amended as follows:

§ 426.123 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable.

The following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, which may be discharged by a point source subject to the provisions of this subpart after application of the best available technology economically achievable:

(a) Any manufacturing plant which frosts incandescent lamp envelopes shall meet the following limitations with regard to the finishing operations.

Effluent characteristics	Effluent limitations: Maximum for any 1 day	Effluent limitations: Average of daily values for 30 consecutive days shall not exceed
(Metric units) g/kkg of product frosted		
Fluoride	104.0	52.0
Ammonia	240.0	120.0
(English units) lb/1000 lb of product frosted		
Fluoride	0.104	0.052
Ammonia	0.24	0.12

7. Section 426.133 of the Hand Pressed and Blown Glass Manufacturing Subcategory is proposed to be amended as follows:

§ 426.133 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable.

The following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, which may be discharged by a point source subject to the provisions of this subpart after application of the best available technology economically achievable:

(a) Any plant which melts raw materials, produces hand pressed or blown leaded glassware, discharges greater than 50 gallons per day of process waste water, and employs hydrofluoric acid finishing techniques shall meet the following limitations.

Effluent characteristics	Effluent limitations: Maximum for any 1 day	Effluent limitations: Average of daily values for 30 consecutive days shall not exceed
	mg/l	
Lead	0.2	0.1
Fluoride	26.0	13.0

(b) Any plant which melts raw materials, produces non-leaded hand pressed or blown glassware, discharges greater than 50 gallons per day of process waste water, and employs hydrofluoric acid finishing techniques shall meet the following limitations.

Effluent characteristics	Effluent limitations: Maximum for any 1 day	Effluent limitations: Average of daily values for 30 consecutive days shall not exceed
	mg/l	
Fluoride	26.0	13.0

40 CFR Subchapter N Part 427 for the Asbestos Manufacturing Point Source Category is proposed to be amended as follows:

1. Section 427.93 of the Solvent Recovery Subcategory is amended to read as follows:

§ 427.93 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable.

The following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, which may be discharged by a point source subject to the provisions of this subpart after application of the best available technology economically achievable.

Effluent characteristics	Effluent limitations: Maximum for any 1 day	Effluent limitations: Average of daily values for 30 consecutive days shall not exceed
(Metric units) kg/kkg of finished asbestos products		
COD	0.30	0.15
TSS	0.18	0.09
(English units) lb/1,000 lb of finished asbestos products		
COD	0.30	0.15
TSS	0.18	0.09

2. A new section 427.97 is added to the Solvent Recovery Subcategory as reads below:

§ 427.97 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology.

The following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, which may be discharged by a point source subject to the provisions of this subpart after application of the best conventional pollutant control technology.

Effluent characteristic	Effluent limitations

pH	Within the range 6.0 to 9.0.

40 CFR Subchapter N Part 432 for the Meat Products Point Source Category is proposed to be amended as follows:

1. The sections listed below are suspended.

Subcategory	Section Designation
Simple Slaughterhouse	40 CFR 432.13
Complex Slaughterhouse	432.23
Low Processing Packinghouse	432.33
High Processing Packinghouse	432.43

2. The new sections listed below are added as follows:

Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology.

(a) The following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section and attributable to on-site slaughter or subsequent meat, meat product or by-product processing of carcasses of animals slaughtered on-site, which may be discharged by a point source subject to the provisions of this subpart after application of the best conventional pollutant control technology.

Effluent characteristic	Effluent limitations
Fecal coliform	Maximum at any time 400 mpn/100 ml.
pH	Within the range of 6.0 to 9.0.

Subcategory	Section Designation
Simple Slaughterhouse	432.17
Complex Slaughterhouse	432.27
Low Processing Packinghouse	432.37
High Processing Packinghouse	432.47

3.(a) Section 432.53 of the Small Processor Subcategory is redesignated as Section 432.57 and

the original section numbers reserved for future use.

(b) The title and first paragraph of the section redesignated above is amended to read as follows:

Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology.

The following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, which may be discharged by a point source subject to the provisions of this subpart after application of the best conventional pollutant control technology.

* * * * *

4. Section 432.63 of the Meat Cutter Subcategory is proposed to be amended as follows:

§ 432.63 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable.

The following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, which may be discharged by a point source subject to the provisions of this subpart after application of the best available technology economically achievable:

Effluent characteristics	Effluent limitations: Maximum for any 1 day	Effluent limitations: Average of daily values for 30 consecutive days shall not exceed
	Milligrams per liter--effluent	
Ammonia	8.0 mg/l	4.0

5. A new Section 432.67 for the Meat Cutter Subcategory is added as follows:

§ 432.67 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology.

The following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, which may be discharged by a point source subject to the provisions of this subpart after application of the best conventional pollutant control technology:

Effluent characteristics	Effluent limitations: Maximum for any 1 day	Effluent limitations: Average of daily values for 30 consecutive days shall not exceed
(Metric units) kg/kkg of finished product		
BOD_5	0.018	0.009
TSS	0.024	0.012
Oil & grease	0.012	0.006
(English units) lb/1,000 lb of finished product		
BOD_5	0.018	0.009
TSS	0.024	0.012
Oil & grease	0.012	0.006
pH	Within the range 6.0 to 9.0	
Fecal coliforms	Maximum at any time 400 mpn/100 ml.	

6. Section 432.73 of the Sausage and Luncheon Meats Processor Subcategory is proposed to be amended as follows:

§ 432.73 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable.

The following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, which may be discharged by

a point source subject to the provisions of this subpart after application of the best available technology economically achievable:

Effluent characteristics	Effluent limitations: Maximum for any 1 day	Average of daily values for 30 consecutive days shall not exceed
	Milligrams per liter--effluent	
Ammonia	8.0 mg/l	4.0

7. A new Section 432.77 for the Sausage and Luncheon Meats Processor Subcategory is added as follows:

§ 432.77 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology.

The following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, which may be discharged by a point source subject to the provisions of this subpart after application of the best conventional pollutant control technology:

Effluent characteristics	Effluent limitations: Maximum for any 1 day	Average of daily values for 30 consecutive days shall not exceed
	(Metric units) kg/kkg of finished product	
BOD_5	0.28	0.14
TSS	0.38	0.19
Oil & grease	0.20	0.10
	(English units) lb/1,000 lb of finished product	
BOD_5	0.28	0.14
TSS	0.38	0.19
Oil & grease	0.20	0.10

pH	Within the range 6.0 to 9.0
Fecal coliforms	Maximum at any time 400 mpn/100 ml.

8. Section 432.83 of the Ham Processor Subcategory is proposed to be amended as follows:

§ 432.83 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable.

The following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, which may be discharged by a point source subject to the provisions of this subpart after application of the best available technology economically achievable:

Effluent characteristics	Effluent limitations: Maximum for any 1 day	Effluent limitations: Average of daily values for 30 consecutive days shall not exceed
	Milligrams per liter--effluent	
Ammonia	8.0 mg/l	4.0

9. A new Section 432.87 for the Ham Processor Subcategory is added as follows:

§ 432.87 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology.

The following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, which may be discharged by a point source subject to the provisions of this subpart after application of the best conventional pollutant control technology:

	Effluent limitations	
	Maximum for	Average of daily

Effluent characteristics	any 1 day	values for 30 consecutive days shall not exceed
	(Metric units) kg/kkg of finished product	
BOD_5	0.32	0.16
TSS	0.42	0.21
Oil & grease	0.22	0.11
	(English units) lb/1,000 lb of finished product	
BOD_5	0.32	0.16
TSS	0.42	0.21
Oil & grease	0.22	0.11

pH	Within the range 6.0 to 9.0
Fecal coliforms	Maximum at any time 400 mpn/100 ml.

10. Section 432.93 of the Canned Meats Processor Subcategory is proposed to be amended as follows:

§ 432.93 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable.

The following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, which may be discharged by a point source subject to the provisions of this subpart after application of the best available technology economically achievable:

Effluent characteristics	Effluent limitations: Maximum for any 1 day	Effluent limitations: Average of daily values for 30 consecutive days shall not exceed
	Milligrams per liter--effluent	
Ammonia	8.0 mg/l	4.0

11. A new Section 432.97 for the Canned Meats Processor Subcategory is added as follows:

§ 432.97 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology.

The following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, which may be discharged by a point source subject to the provisions of this subpart after application of the best conventional pollutant control technology:

Effluent characteristics	Effluent limitations: Maximum for any 1 day	Effluent limitations: Average of daily values for 30 consecutive days shall not exceed
	(Metric units) kg/kkg of finished product	
BOD_5	0.34	0.17
TSS	0.44	0.22
Oil & grease	0.26	0.13
	(English units) lb/1,000 lb of finished product	
BOD_5	0.34	0.13
TSS	0.44	0.22
Oil & grease	0.26	0.13
pH	Within the range 6.0 to 9.0	
Fecal coliforms	Maximum at any time 400 mpn/100 ml.	

12. Section 432.103 of the Renderer Subcategory is proposed to be amended as follows:

§ 432.103 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable.

(a) Subject to the provisions of paragraph (b) of this section, the following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, which may be discharged by a point source subject to the provisions of this subpart after application of the best available technology economically achievable:

Effluent characteristics	Effluent limitations: Maximum for any 1 day	Effluent limitations: Average of daily values for 30 consecutive days shall not exceed
	(Metric units) kg/kgg of raw material	
Ammonia	0.04 mg/l	0.02
	English units lb/1,000 lb of raw material	
Ammonia	0.04	0.02

13. A new Section 432.107 for the Renderer Subcategory is added as follows:

§ 432.107 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology.

(a) Subject to the provisions of paragraph (b) of this section, the following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, which may be discharged by a point source subject to the provisions of this subpart after application of the best conventional pollutant control technology:

Effluent characteristics	Effluent limitations: Maximum for any 1 day	Effluent limitations: Average of daily values for 30 consecutive days shall not exceed
	(Metric units) kg/kkg of finished product	

BOD_5	0.14	0.07
TSS	0.20	0.10
Oil & grease	0.10	0.05
pH	Within the range 6.0 to 9.0	
Fecal coliforms	Maximum at any time 400 mpn/100 ml.	

(English units) lb/1,000 lb of finished product		
BOD_5	0.14	0.07
TSS	0.20	0.10
Oil & grease	0.10	0.05
pH	Within the range 6.0 to 9.0	
Fecal coliforms	Maximum at any time 400 mpn/100 ml.	

(b) The limitations given in paragraph (a) of this section for BOD_5 and TSS are derived for a renderer which does no cattle hide curing as part of the plant activities. If a renderer does conduct hide curing, the following empirical formulas should be used to derive an additive adjustment to the effluent limitations for BOD_5 and TSS.

$$BOD_5 \text{ Adjustment (kg/kkg RM)} = \frac{3.6 \times (\text{number of hides})}{\text{kg of raw material}}$$

$$\text{(lb/1,000 lb RM)} = \frac{7.9 \times (\text{number of hides})}{\text{lbs of raw material}}$$

$$\text{TSS Adjustment (kg/kkg RM)} = \frac{6.2 \times (\text{number of hides})}{\text{kg of raw material}}$$

$$\text{(lb/1,000 lb RM)} = \frac{13.6 \times (\text{number of hides})}{\text{lbs of raw material}}$$

APPENDIX A
DOCUMENTS USED IN THE ANALYSIS

The data for each of the industry categories were taken from the documents listed below.

1.	Dairy Products	
	Dairy Products Processing	EPA 440/1-74-021-a
2.	Grain Mills	
	Grain Processing	EPA 440/1-74-028-a
	Animal Feed, Breakfast Cereal and Wheat Starch	EPA 440/1-74/039-a
	Corn Wet Milling	EPA 440/1-78/028-b Supplement
3.	Fruits and Vegetables	
	Apple, Citrus and Potato Products	EPA 440/1-74-027-a
	Economic Analysis of the Fruits and Vegetables Category (Phase II)	EPA 230/1-75-036 Supplement II March, 1977
4.	Seafood	
	Fish Meal, Salmon, Bottom Fish Clam, Oyster, Sardine, Scallop, Herring, and Abalone	EPA 440/1-75/041-a
5.	Sugar Processing	
	Beet Sugar Processing	EPA 440/1-74-002-b
	Cane Sugar Processing	EPA 440/1-74-002-c
6.	Cement Manufacturing	
	Cement Manufacturing	EPA 440/1-74-005-a
7.	Feedlots	
	Feedlots	EPA 440/1-74/004-a
8.	Phosphate Manufacturing	
	Other Non-Fertilizer Phosphate Chemicals	EPA 440/1-75/043-a
9.	Ferroalloys	
	Smelting and Slag Processing	EPA 440/1-74/008-a
	Calcium Carbide	EPA 440/1-75/038
	Electrolytic Ferroalloys	EPA 440/1-75/038-a

10. <u>Glass Manufacturing</u>

Pressed and Blown Glass	EPA 440/1-75-034-a
Flat Glass	EPA 440/1-74-001-c
Insulation Fiberglass	EPA 440/1-74-001-b

11. <u>Meat Products</u>

Red Meat Processing	EPA 440/1-74-012-a
Processor	EPA 440/1-74/031
Independent Rendering	EPA 440/1-77/031-e Supplement

APPENDIX B

METHODOLOGY

One of the requirements that must be met in issuing a BCT effluent regulation is that it must meet the test of reasonableness. The Agency is proposing to judge reasonableness by the following methodology. The test has two basic elements:

(1) Compare the incremental costs of removal of conventional pollutants for an industrial discharger with removal costs at a model POTW; and if industrial costs are less than those at a POTW, the regulation is judged reasonable.

(2) Where the incremental costs for the industrial discharger exceed those at the model POTW, the concentrations of the conventional pollutant(s) are compared to concentration levels required of POTWs and if the industrial concentrations significantly exceed the POTW concentrations the regulation is judged reasonable.

The major concern is how the costs of POTWs and industrial subcategories are developed. A methodology is developed below that allows the Agency to make an appropriate comparison of these costs.

Incremental Costs: Economic theory supports the comparison of marginal costs to obtain an optimal utilization of resources. Society, if in economic equilibrium, will have best allocated its resources to obtain some level of pollution control where the marginal cost of removing a specified pollutant is the same wherever it is being removed. Based on the premise set forth by Congress that the current level of pollutant removal by POTWs is reasonable, the marginal cost of removal is reasonable. Thus, it is the marginal costs of industrial and municipal treatment that are compared, i.e., at the margin what is the cost to remove an additional pound of pollutant to meet secondary POTW or BCT requirements? Obtaining accurate estimates of marginal costs can be difficult and is usually approximated by the use of increments.

Estimation of the incremental costs for industry is relatively straightforward, since the increment between BPT and BAT (and in the future, BCT) is well-defined. The incremental cost of conventional pollutant removal by industry is calculated by dividing the additional total annual expense incurred to increase treatment from BPT to BAT/BCT by the additional mass of conventional pollutants removed.

Determination of the incremental cost for POTWs is more difficult, although the concept is similar. For larger POTWs (1 mgd and over), the additional cost to upgrade an activated sludge system that just meets secondary treatment requirements to an activated sludge system that has slightly longer retention time and can exceed secondary requirements is divided by the additional quantity of conventional pollutants removed. This represents as accurate a marginal cost as can be calculated with publicly available data. For other POTWs (less than 1 mgd) the incremental cost is calculated for upgrading a facultative lagoon to a package treatment system. These two systems are more commonly used for small POTWs and represent normal costs for those sizes.

Handling Various Combinations of Conventional Pollutants: The methodology for judging reasonableness compares the incremental cost of removal of conventional pollutants by an industrial source to the incremental cost of removal of conventional pollutants by a POTW of similar flow. The conventional pollutants listed in the Act are suspended solids, biological oxygen demand, pH, and fecal coliform, with the addition to the list of oil and grease, chemical oxygen demand, and total phosphorus imminent. These pollutants (except pH and coliform) fall into three sometimes overlapping categories, namely, solids, oxygen demanding substances, or nutrients. Normal secondary municipal treatment is designed to remove oxygen demand and solids. Oil and grease and chemical oxygen demand measure a pollutant problem somewhat different than biological oxygen demand, but in essence their removal still has the same effect on the nation's waterways, that is, to lessen oxygen demanding substances.

Based on this rationale, the comparison of incremental industrial costs of removal with incremental POTW costs of removal only considers biological oxygen demand and suspended solids. Adding BOD and TSS together is based on the premise that BOD and TSS are removed jointly in a POTW. By weighting BOD and TSS equally means that the cost of municipal treatment is being allocated equally to each pound of BOD or TSS being removed by the POTW. If BOD is not regulated in a particular industry either COD or oil and grease, if regulated, will be used to represent the oxygen demanding characteristics of the industrial wastestream. The removal of phosphorus from a wastestream can be handled in a somewhat different manner, since its removal at a POTW is primarily performed by a treatment technology separate from normal secondary treatment. Thus, phosphorus removal at a model POTW can be estimated independently of the other pollutants.

The POTW comparison number is calculated by dividing the additional cost of upgrading a POTW by the additional removal of conventional pollutants, where the sum of the pounds of BOD and TSS removed is used to represent the removal of conventional pollutants. By considering an activated sludge POTW and another somewhat better (longer retention time) activated sludge POTW, the difference in cost and removal of pollutants can be estimated.

The incremental cost of conventional pollutant removal by industry is calculated by dividing the additional total annual expense incurred when going to BAT/BCT from BPT by the additional pounds of BOD and TSS removed. This yields an incremental cost that is directly comparable to the incremental cost number developed for POTWs. A problem arises in the industrial calculation when either BOD or TSS is not regulated (and therefore no acceptable calculation for its removal is possible). In these cases the concept of conventional pollutants is used, since solids and oxygen demand are of primary interest. If BOD is not regulated, then pounds of COD, or oil and grease removed are substituted (in that order of priority). This approach approximates the incremental cost of removal for conventional pollutants as opposed to the incremental cost of removal of individual pollutants. For each industrial subcategory being analyzed in this 'reasonableness' test there are 4 conventional pollutants which may enter into this POTW cost comparison calculation. Table 31 displays the possible combinations of those 4 pollutants and indicates for each combination which pollutant removals are used in the industrial cost calculation.

The reasonableness test for regulations requiring the removal of total phosphorus is parallel to that for the other conventional pollutants. The removal of total phosphorus by a municipal treatment system is generally achieved by the addition of alum to the wastewater, since secondary treatment generally achieves little phosphorus removal. This treatment is in addition to the normal secondary treatment, so the cost of removing total phosphorus can be isolated from the cost of removing other conventional pollutants. Thus, the incremental cost of removal of total phosphorus in a POTW can be estimated and used as a criteria for judging reasonableness. The cost of total phosphorus removal by industry can be estimated in those cases in which the costs of technology for total phosphorus removal can be isolated from the other costs. The industrial incremental cost of total phosphorus removal is then compared to the cost of removal by a POTW. If the cost of removal by industry is the same or lower than at a model POTW, the regulation controlling total phosphorus is judged to be reasonable. In those instances for which the cost of total phosphorus removal can not be isolated from the other treatment costs incurred by industry, all costs of treatment are allocated to the other conventional pollutants and no specific comparison of total phosphorus removal costs is made.

It is clear that the approach for testing the reasonableness of the total phosphorus regulations is somewhat different than for the other conventional pollutants. The reasonableness test for total phosphorus requires costs for an identifiable treatment for total phosphorus to be isolated from the treatment costs for other pollutants. For POTWs alum addition is considered to treat specifically for phosphorus and thus, all the additional costs for alum addition beyond normal secondary treatment can be allocated to total phosphorus removal. For industrial dischargers it is often much more difficult to allocate the costs of their more complex treatment systems, making cost comparisons difficult. Due to these particular problems, the Agency solicits your comments on the methodology for testing the reasonableness of total phosphorus regulations. If your comments include alternative methodologies be sure to include any documentation, data used, and sample calculations.

The remaining two conventional pollutants, pH and fecal coliform are not being considered in the reasonableness test. For industries under review pH and fecal coliform regulations do not change from BPT to BCT/BAT.

Flow Basis for Comparison: The incremental cost of pollutant removal by industrial dischargers is estimated based on model plants that were used in the development of the regulations. These model plants were often based on various production levels and flows in order to represent a range of plants affected by the regulations. The incremental cost estimated for each of the models varies significantly depending on the flow. Since various flow size models are used for the estimation of the industrial cost of removal, it is necessary to consider POTWs of various flows in order to ensure comparability of the incremental costs. Thus, this methodology compares the costs of removal based on industrial systems and POTWs of the same flow size.

Concentration Test: In those cases in which a regulation is judged unreasonable based on the POTW comparison test, a second test compares the concentration of BOD and TSS in the effluent of a POTW at secondary treatment with the concentration of conventional pollutants from an industrial source after BAT/BCT is in place. This concentration test is a means to check the absolute level of performance of an industrial system with that of a municipal system. If the industry pollutant concentrations exceed those at a POTW, the Agency weighs this higher concentration against the magnitude by which the POTW cost criteria was surpassed. If the concentration is significantly higher than at a POTW and the POTW cost test was not failed by a great margin, the Agency judges the regulation reasonable.

TABLE 31

Conventional Pollutants to be Included in the Industrial Cost of Pollutant Removal

Pollutants being regulated	Pollutants to be Included*			
	BOD	TSS	O&G	COD
BOD	x			
TSS		x		
O&G			x	
COD				x
BOD, TSS	x	x		
BOD, O&G	x			
BOD, COD	x			
TSS, O&G		x	x	
TSS, COD		x		x
O&G, COD				x
BOD, TSS, O&G	x	x		
BOD, TSS, COD	x	x		
BOD, O&G, COD	x			
TSS, O&G, COD		x		x
BOD, TSS, O&G, COD	x	x		

* Total phosphorus is being analyzed separately.

APPENDIX C

THE COST OF POLLUTANT REMOVAL BY PUBLICLY OWNED TREATMENT WORKS

Background: As part of determining the reasonableness of regulations for conventional pollutants, Congress suggested that the Agency compare the cost to remove pollutants by publicly owned treatment works (POTWs) with the cost of removing pollutants by industrial dischargers. The following material presents estimates of these costs for various types of POTWs. The POTW reasonableness criteria is based on the incremental cost of removal of conventional pollutants. In order to estimate these incremental removal costs, the total annual cost and the total pollutant removal of POTWs must be estimated. The incremental costs are then calculated by considering two different types of treatment systems that achieve a slightly different removal of pollutants. The POTW incremental costs are developed below in three steps. First the annual costs for municipal systems are estimated, and second the pollutant removal of the systems is calculated. The third step combines the cost and removal estimates to develop the incremental costs of pollutant removal.

Total Annual POTW Costs: The cost estimates are based primarily on public documents issued by the Agency. All cost estimates may be adjusted by use of the sewage treatment plant construction cost index as presented below.

Date	Cost Index
3/76	256.7
6/76	259.6
9/76	262.5
12/76	270.3
1976	262.2
3/77	270.9
7/77	273.8
9/77	281.0

The capital costs for a POTW are annualized by the application of a capital recovery factor. The capital costs are annualized on the basis of 30 years at 10 percent interest (divide by 9.427) for activated sludge systems, 50 years at 10 percent interest (divide by 9.915) for lagoons, and 9 years at 10 percent interest (divide by 5.759) for contact stabilization package plants. Three primary sources of information were used in developing the POTW costs. Each one of the reference sources uses slightly different techniques and assumptions to obtain the final cost, so each reference is discussed below. In each case, however, whenever cost estimates are made for an activated sludge system a custom engineered and fabricated unit is being considered and whenever cost estimates are made for a contact stabilization system a package unit is being considered.

The "Areawide Assessment Procedures Manual, Appendix H, Point Source Control Alternatives" is compiled by the EPA Laboratory in Cincinnati,Ohio. The cost curves used from this reference include the equipment, labor, and miscellaneous structures needed to build the treatment system. For facultative lagoons though, the additional cost of the necessary miscellaneous structures must be added to the equipment costs. The cost of miscellaneous structures for facultative lagoons are estimated to be 50% of those presented in this reference, since smaller treatment systems do not require a full complement of miscellaneous structures. To these construction costs must be added the cost of site preparation, piping, electrical work, engineering supervision, and contingency costs which adds an additional 36.4 percent to the equipment costs. The operating and maintenance costs were taken directly from the operating and maintenance cost tables provided for each type of treatment system. The costs in this reference are in September 1976 dollars and are presented in Table C1 and C2.

TABLE C1

COSTS OF MUNICIPAL TREATMENT
(Based on Areawide Assessment Manual)
In millions of 9/76 dollars

Treatment System	Flow, mgd	Equipment Cost	Other Construction Cost	Total Capital Cost	Annualized Capital Cost	O&M	Total Annual Cost
activated	.10	.490	.178	.668	.071	.060	.131
sludge	.25	.700	.255	.955	.101	.073	.174
	.50	.940	.342	1.282	.136	.092	.228
	1.00	1.250	.455	1.705	.181	.130	.311
	20.00	9.000	3.276	12.276	1.302	.870	2.172
activated	.10	.530	.193	.723	.077	.062	.139
sludge	.25	.780	.284	1.064	.113	.078	.191
plus	.50	1.050	.382	1.432	.152	.105	.257
phosphorus	1.00	1.500	.546	2.046	.217	.150	.367
removal	20.00	10.000	3.640	13.640	1.447	1.200	2.647
Contact	.1	.120	.044	.164	.028	.014	.042
Stabil-	.15	.150	.055	.205	.036	.016	.052
ization	.25	.180	.066	.246	.043	.021	.064
(package	.50	.250	.091	.341	.059	.033	.092
system)	1.00	.320	.115	.436	.076	.050	.126

TABLE C2

COST OF FACULTATIVE LAGOONS
(based on Areawide Assessment Manual)
In millions of 9/76 dollars

Flow, mgd	Equipment Cost	Misc. Structures Cost	Other Construction Cost	Total Capital Cost	Annualized Capital Cost	Total O&M Cost	Total Annual Cost
.10	.078	.014	.033	.125	.013	.012	.025
.15	.110	.016	.046	.172	.017	.013	.030
.25	.150	.019	.062	.231	.023	.014	.037
.50	.250	.025	.100	.375	.038	.017	.055
1.00	.410	.035	.162	.607	.061	.021	.082

The "Technical Policy and Procedures 1978 Survey of Needs for Publicly Owned Wastewater Facilities" is another source from which cost estimates are obtained. The cost curves in this reference include all the capital costs related to construction. The operating and maintenance costs are estimated as 10 percent of the capital cost and are added to the annualized capital costs to obtain the total annual cost. The costs in this reference are in January 1978 dollars. The cost estimates obtained by using this reference are presented in Table C3.

TABLE C3

COSTS OF MUNICIPAL TREATMENT
(based on the Survey of Needs)
In millions of 1/78 dollars

Treatment System	Total Flow, mgd	Capital Cost	Annualized Capital Cost	Total Operating Maintenance	Annual Cost
activated sludge	.01	.042	.004	.004	.008
	.05	.175	.019	.018	.037
	.10	.300	.035	.033	.068

.25	.740	.078	.074	.152
.50	1.370	.145	.137	.282
1.00	2.550	.270	.255	.525

"An Analysis of Construction Cost Experience for Wastewater Treatment Plant" dated February 1977 is printed by the Municipal Construction Division at EPA. The cost curves are used to estimate the capital cost of a POTW. The operating and maintenance costs are estimated as 10 percent of the capital cost and are added to the annualized capital costs to obtain the total annual cost. The cost estimates presented in this reference are in September 1976 dollars based on the sewage treatment plant index of 263. The cost estimates obtained by using this reference are presented in Table C4.

TABLE C4

COSTS OF MUNICIPAL TREATMENT
(based on an Analysis of Construction Cost Experience)
in millions of 9/76 dollars

Treatment System	Flow, mgd	Total Capital Cost	Annualized Capital Cost	O&M Cost	Total Annual Cost
activated sludge	.01	.051	.005	.005	.010
	,10	.330	.035	.003	.038
	.15	.460	.049	.046	.095
	.25	.700	.074	.070	.144
	1.00	2.150	.228	.215	.443
	2.00	3.750	.398	.375	.773
	3.00	5.200	.552	.520	1.072
	18.00	22.750	2.413	2.275	4.688
activated sludge	.01	.061	.006	.006	.012
	.10	.390	.041	.039	.080

with	.15	.550	.058	.055	.113
additional	.25	.920	.087	.082	.169
retention	1.00	2.500	.265	.250	.515
	2.00	4.425	.469	.443	.912
	3.00	6.200	.658	.620	1.278
	18.00	27.250	2.891	2.725	5.616

Pollution Removal by POTWs: The conventional pollutants under consideration are biological oxygen demand, suspended solids, pH, fecal coliform, chemical oxygen demand, oil and grease, and total phosphorus. Most municipal treatment systems remove or can be designed to remove these pollutants. Of these pollutants the removal of biological oxygen demand, suspended solids, and total phosphorus have been estimated, since the remaining conventional pollutants are not being directly considered in the POTW reasonableness criteria. The removal rate of a pollutant equals the flow of the POTW times the change in concentration of the pollutant as it passes through the system. For the calculations presented here the influent concentration is 210 mg/l for biological oxygen demand, 230 mg/l for suspended solids, and 11 mg/l for total phosphorus all based on the "Areawide Assessment Manual." Thus for a 1 mgd POTW that treats biological oxygen demand to 25 mg/l and suspended solids to 25 mg/l the calculation for removal is: Flow X change in concentration = (1 million gallons/day) X ((210 + 230) - 25 +25)) mg/l = (1 million gallons/day) X (390 mg/l) = (1 million gallons/day) X (390 mg/l) X (365 days/ year X 3.785 1/gallon X pound/454,000 mg) = 1 mgd X 390 mg/l X .00304 = 1.186

million pounds of BOD and TSS removed per year.

Removal of BOD and TSS is presented in Table C5 for several different levels of treatment.

TABLE C5

REMOVAL OF BOD AND TSS BY POTWS

Effluent Concentration mg/l of BOD Plus TSS	Influent Concentration mg/l of BOD Plus TSS	Change in Concentration mg/l of BOD Plus TSS	Flow mgd	Removal, million pounds BOD Plus TSS
90 (lagoon)	440	350	.01	.01064
			.10	.1064
			.15	.1596
			.25	.2660
			.50	.5320
			1.00	1.064
50 (activated sludge or contact stabilization)	440	390	.01	.01186
			.10	.1186
			.15	.1778
			.25	.2964
			1.00	1.186
			2.00	2.371
			3.00	3.557
			18.00	21.35
24 (activated sludge with additional retention)	440	416	.01	.01265
			.10	.1265
			.15	.1897
			.25	.3162
			1.00	1.265
			2.00	2.529
			3.00	3.794
			18.00	22.77

Removal of total phosphorus is estimated in the same manner as for BOD and TSS and is presented in Table C6. The removal rates are based on the "Areawide Assessment Procedures Manual."

TABLE 66

REMOVAL OF TOTAL PHOSPHORUS BY POTWS

Treatment System	Effluent Concentration mg/l of P	Influent Concentration mg/l of P	Change in Concentration	Flow mgd	Removal, million pounds of P
activated sludge	7	11	4	.10	.001216
				.25	.003040
				.50	.006080
				1.00	.01216
				20.00	.2432
activated sludge plus alum	2	11	9	.10	.002736
				.25	.006840
				.50	.01368
				1.00	.02736
				20.00	.5472

Incremental Cost of Removal: The comparison of municipal and industrial costs of pollutant removal are being made on an incremental basis in an attempt to approximate the marginal cost of removal. Graphically this is done by plotting the total cost curve for a POTW of a given flow versus the quantity of pollutant removed, then measuring the slope of the curve for the quantity of pollutant removed that corresponds to secondary treatment. To approximate this marginal cost a small incremental change is used. The costs are in September 1976 dollars to ensure comparability to the industrial costs.

The primary criteria for selecting the two treatment systems on which to base an incremental cost are that the two systems provide a small difference in removal rates (so it is an approximation of a marginal cost), that the two systems are similar to those used for sewage treatment by municipalities, that both systems have cost curves in one public reference source (so that the difference in cost is due to the differences in the systems, not in variations in cost estimating procedures), and that the systems are not specifically designed to remove pollutants other than BOD and TSS (so the additional costs can accurately be applied to the removal of BOD and TSS). Using these four criteria has led to choosing two different activated sludge treatment systems for flows of 1 mgd and greater, and choosing a facultative lagoon and a contact stabilization package system as the treatment systems providing a basis for an incremental cost of removal for flows of 1 mgd and less. The first activated sludge system achieves an average effluent concentration of 25 mg/l each for both BOD and TSS, with the second system achieving an average effluent concentration of 12 mg/l each for BOD and TSS through the use of greater retention time. These systems are from "An Analysis of Construction Cost Experience for Wastewater Treatment Plants." For cities under 10,000 population the Agency makes an additional effort in finding cost effective methods of treating municipal wastes. Often for these smaller cities the permit requirements are loosened to allow the city to achieve compliance with the permit through the use of facultative lagoons. Thus, to approximate a marginal cost at lower flows the incremental cost of pollutant

removal is estimated by going from a facultative lagoon achieving a BOD concentration of 30 mg/l and a TSS concentration of 60 mg/l to a package treatment system achieving a BOD and TSS concentration of 25 mg/l each. These systems are from the "Areawide Assessment Procedures Manual." A city of 10,000 population corresponds to a flow of about 1 million gallons per day, so all marginal costs for under 1 mgd presented in Table C7 are based on facultative lagoons and package treatment systems. The incremental cost of removal for flows of .01 mgd to .10 mgd has been estimated by a linear extrapolation of the cost estimates developed for .10 mgd and .15 mgd POTWs. This extrapolation was necessary, since not all references used included cost estimates for .01 mgd systems. The results are presented in Table C7.

TABLE C7

INCREMENTAL REMOVAL COSTS OF BOD AND TSS BY POTWS

Flow mgd	Change in Cost, million dollars	Change in Removal, million lbs. per year	Incremental cost, $/lb.
.01	----	----	1.72
.10	.017	.0122	1.39
.15	.022	.0182	1.21
.25	.027	.0304	.89
.50	.037	.0608	.61
1.00	.044	.1220	.36
1.00	.072	.079	.91
2.00	.139	.158	.88
3.00	.206	.237	.87
18.00	.928	1.42	.65

The results of Table C7 were plotted on a graph and connected by straight lines. It was then possible to find the incremental removal cost of BOD and TSS by a POTW of any flow size. For convenience, the incremental costs for various flows are presented in tabular form in Table C8.

TABLE C8

INCREMENTAL COST OF REMOVING BOD AND TSS BY POTWs (in 9/76 dollars)

Flow, mgd	Incremental Cost, $/lb.	Flow, mgd	Incremental Cost, $/lb.	Flow, mgd	Incremental Cost, $/lb.	Flow, mgd	Incremental Cost, $/lb.
.01	1.72	.06	1.54	.11	1.35	.16	1.17
.02	1.68	.07	1.51	.12	1.32	.17	1.14
.03	1.64	.08	1.47	.13	1.28	.18	1.12
.04	1.60	.09	1.43	.14	1.25	.19	1.08
.05	1.58	.10	1.39	.15	1.20	.20	1.04
.21	1.01	.26	.88	.31	.81	.36	.75
.22	.98	.27	.87	.32	.80	.37	.74
.23	.94	.28	.86	.33	.79	.38	.73
.24	.92	.29	.84	.34	.78	.39	.72
.25	.89	.30	.82	.35	.77	.40	.71
.41	.70	.46	.65	.51	.60	.56	.58
.42	.69	.47	.64	.52	.60	.57	.58
.43	.68	.48	.63	.53	.60	.58	.57
.44	.67	.49	.62	.54	.59	.59	.57
.45	.66	.50	.61	.55	.59	.60	.56
.61	.56	.66	.53	.71	.51	.76	.47
.62	.55	.67	.53	.72	.50	.77	.47
.63	.54	.68	.52	.73	.49	.78	.46
.64	.54	.69	.52	.74	.48	.79	.46
.65	.53	.70	.51	.75	.48	.80	.46
.81	.45	.86	.43	.91	.40	.96	.38
.82	.45	.87	.42	.92	.40	.97	.37
.83	.44	.88	.42	.93	.39	.98	.37
.84	.44	.89	.41	.94	.39	.99	.36
.85	.43	.90	.41	.95	.38	1.00	.31

1.1	.90	1.6	.89	2.1	.88	2.6	.87
1.2	.90	1.7	.89	2.2	.88	2.7	.87
1.3	.90	1.8	.89	2.3	.87	2.8	.87
1.4	.90	1.9	.88	2.4	.87	2.9	.87
1.5	.89	2.0	.88	2.5	.87	3.0	.87
3.1	.87	3.6	.86	4.1	.85	4.5	.84
3.2	.86	3.7	.86	4.2	.85	4.7	.84
3.3	.86	3.8	.85	4.3	.85	4.8	.84
3.4	.86	3.9	.85	4.4	.85	4.9	.84
3.5	.86	4.0	.85	4.5	.85	5.0	.84
5.1	.84	5.6	.83	6.1	.82	6.6	.82
5.2	.84	5.7	.83	6.2	.82	6.7	.81
5.3	.83	5.8	.83	6.3	.82	6.8	.81
5.4	.83	5.9	.83	6.4	.82	6.9	.81
5.5	.83	6.0	.82	6.5	.82	7.0	.81
7.1	.81	7.6	.80	8.1	.79	8.6	.79
7.2	.81	7.7	.80	8.2	.79	8.7	.79
7.3	.80	7.8	.80	8.3	.79	8.8	.78
7.4	.80	7.9	.80	8.4	.79	8.9	.78
7.5	.80	8.0	.80	8.5	.79	9.0	.78
9.1	.78	9.6	.77	11	.75	16	.68
9.2	.78	9.7	.77	12	.74	17	.67
9.3	.78	9.8	.77	13	.72	18	.65
9.4	.77	9.9	.77	14	.71		
9.5	.77	10	.77	15	.69		

To determine the incremental removal cost of total phosphorus, data from the "Areawide Assessment Procedures Manual" was used. The activated sludge system achieves an effluent concentration of 7 mg/l total phosphorus, whereas, an activated sludge system with the addition of alum achieves an effluent concentration of 2 mg/l total phosphorus. Using the change in costs and pollutant removal between these two systems allows the calculation of the incremental costs of removal as presented in Table C9.

TABLE C9
INCREMENTAL REMOVAL COST OF TOTAL PHOSPHORUS BY POTWS

Flow, mgd	Change in cost, Million dollars per year	Change in Removal, Million lbs. per year	Incremental Cost, $/lb.
.10	.008	.00152	5.26
.25	.017	.00380	4.47
.50	.029	.00760	3.82
1.00	.056	.0152	3.68
20.00	.475	.3040	1.56

<u>Limitations of the Estimates:</u> The primary limitation in the costs and removals estimated are that they are just that--estimates. The actual costs and removals actually experienced by any specific POTW may differ from the estimates. One of the references used was, however, an empirical study of bids submitted to build POTWs. The cost estimates do not include the cost of land or the cost of sewers, however, these have very little if any effect on incremental costs. POTW costs are not estimated for flows of less than .01 mgd, since data is generally not available for flows smaller than this. However, there are not a large number of POTWs smaller than .01 mgd.

One of the primary concerns with the estimation of the incremental costs has been to achieve a good approximation of marginal costs. Two factors that may have a substantial effect on the estimate are the size of the increment considered and the 'location' of the increment (below secondary treatment, stradling secondary treatment, or beyond secondary treatment).

For flows of under 1 mgd the increment ranges from less stringent than secondary treatment to about secondary treatment. For flows greater than 1 mgd the increment ranges from about secondary treatment to beyond required secondary treatment. Since neither of these increments exactly stradles secondary treatment, the incremental costs of pollutant removal will be affected. The Agency believes that the slight shifting of the increments away from stradling secondary requirements for the over 1 mgd systems does not materially affect the incremental cost estimates. In addition the Agency believes that utilizing smaller sized increments would have little effect on the incremental cost of removal estimates. Any comments concerning the size of the increments used or the 'location' of the increments should be submitted to the Agency with supporting documentation, data, and calculations.

Another related issue regards the types of systems on which the incremental costs are based. For example, the incremental cost of pollutant removal for a 2 mgd POTW could be based on a lagoon that achieves secondary requirements and a lagoon that exceeds secondary requirements, rather than on activated sludge systems. In other words, the treatment systems that are the basis for the total cost curves affect the slope of the total cost curves, and thus must affect the estimate of marginal costs (or in this case the estimated incremental costs). The analysis has been performed based on treatment systems that are most representative of those actually used for each particular flow, however, comments regarding the applicability of the systems are solicited. Along with your comments send any documentation, data, or calculations that support the comment.

APPENDIX C

Industrial Category Discussion
Summary Table of Data

Following is a category - by - category discussion of the analysis of each of the guidelines under review.

Following the discussion, Table C1 summarizes the data used in the determination of the reasonableness of the guidelines. The table lists the model plants that were considered for each subcategory for each industry in this review. Column 1 indicates the waste water flow of the model plant that was used for purposes of comparing costs of removal to a POTW of a similar flow. Column 2 shows the cost per pound of conventional pollutant removed, while column 3 shows the cost per pound for a POTW of comparable flow. Columns 4 and 5 show final effluent concentrations of conventional pollutants for the industrial dischargers and the POTWs, respectively.

Dairy Products Processing (40 CFR 405)

Pollutants controlled: In all subcategories the only conventional pollutants controlled are BOD_5, total suspended solids, and pH. Non-conventional and toxic pollutants are not controlled.

Methodology: Costs and pollutant removals for model plants in each subcategory were constructed from information contained in the development document. This information was based on production, waste water flow, waste loading and waste load reduction at the BPT and

BAT levels, and the costs to achieve those levels. In all of the subcategories, there are different limitations for small and large plants. The limitations for the small plants are less stringent than those for the large plants in the subcategory. Each set of model plants was constructed so as to test the two sets of limitations in each subcategory. The small plant was assumed to receive one-half the level of milk equivalent specified in each subcategory regulation, while the large plant was assumed to receive twice the level of milk equivalent specified in each subcategory regulation. For example, if the size cutoff specified between the different regulations in a subcategory was 100,000 pounds per day of milk equivalent, it was assumed that the small plant received 50,000 pounds per day and the large plant received 200,000 pounds per day.

Results: Controls of pH were reasonable because BAT guidelines do not require stricter control than what was required under BPT, therefore the pH level at BCT is being proposed equal to BPT control.

For all subcategories, controls of BOD_5 and TSS are reasonable because the model plants exhibit lower costs than POTWs to remove a pound of BOD_5 and TSS. Therefore, all twelve BAT regulations for the dairy products processing industry are being withdrawn and indentical BCT limitations are being proposed.

For two subcategories, condensed milk (Subpart I) and condensed whey (Subpart K), discharges of barometric condenser water for small plants were allowed for BPT, while no discharge of barometric condenser water was assumed for BAT. For these subcategories the

Agency does not have any cost data for recycle of barometric condenser water although the mass removal of BOD_5 and TSS is known. The Agency believes that if the costs of recycling or treating barometric condenser water were available, the cost per pound would not be more than for POTWs of the same flow. Therefore the BAT regulations for these subcategories were determined to be reasonable.

Grain Mills (40 CFR 406)

Pollutants Controlled: In all subcategories, the only conventional pollutants controlled are BOD_5, TSS, and pH. Non-conventional and toxic pollutants are not controlled.

Methodology: Data for all sizes of model plants used are taken from the development documents for the industry. This data includes plant costs to achieve those levels of control. The data are based on production, waste water flow, waste loading and waste load reduction at the BPT and BAT levels of control and the costs to achieve those levels of control. In those instances where more than one model plant has been developed to represent the subcategory, cost tests are applied for all model plants.

Results: Controls of pH are reasonable because BAT guidelines do not require stricter control than what was required under BPT. Consequently, pH for all subcategories is being proposed equal to the pH control at BAT.

Four of the subcategories (normal wheat flour milling, normal rice milling, animal feed, and hot cereal) are subject to a BPT and BAT regulation of zero discharge and therefore do not require any further analysis. BCT will call for a zero discharge limitation for these four subcategories. BAT is being kept in force because the zero discharge limitations applies to all pollutants, not conventional pollutants.

Of the six remaining subcategories in this category, only one (bulgur wheat flour milling) is determined to be unreasonable. The cost per pound of BOD5 and TSS removed exceeds the costs of a POTW of the same size while the final effluent concentrations are significantly lower. The BAT control of BOD5 and TSS for this subcategory is being withdrawn while the BCT control of pH is proposed equal to BAT control of pH.

The remaining five subcategories have reasonable BAT limitations for conventional pollutants. Therefore, the Agency is proposing that the BCT effluent guidelines limitations for the remaining five subcategories (corn wet milling, corn dry milling, parboiled rice processing, ready-to-eat cereal and wheat starch and gluten) be equal to the existing BAT effluent limitations guidelines for conventional pollutants.

Canned and Preserved Fruits and Vegetables Processing (40 CFR 407)

<u>Pollutants Controlled:</u> In all subcategories, BOD5, TSS, and pH are controlled. In one subcategory (canned and miscellaneous specialities) oil and grease are also controlled. Toxic and non-conventional pollutants are not controlled in any of the subcategories.

<u>Methodology:</u> Data for model plants in all of the subcategories is taken from the development document and economic analysis for the industry. This data includes information on production, waste

water flow, pollutant load concentration, pollutant load reduction at the BPT and BAT levels of control, and costs to achieve those levels of control.

Results: (1) apple juice, citrus products, frozen potato products, dehydrated potato products: The limitation of pH is reasonable because it is the same at both BPT and BAT. Therefore, the BCT pH limitation is being proposed as equal to BPT. The BAT guidelines for all four of these subcategories for TSS and BOD5 are determined to be reasonable, although in one subcategory (citrus products) the small model plant exhibits a slightly higher cost then a comparable POTW. However, because the costs are so close, and because the large model plant costs are clearly reasonable, the BAT guidelines are judged to be reasonable.

(2) apple products: Two model plants were tested in this subcategory. For the large model plant (100 tons per day) the costs per pound of conventional pollutant removed are $.18 per pound as compared to to $.90 per pound for a POTW of a similar flow. However, for the small model plant (10 tons per day) the POTW cost is less. It was determined that the BAT effluent guideline for the large plant is reasonable, while the BAT effluent guideline for the small plant is unreasonable. However, since there are a number of industrial dischargers which have flows that range between the two sizes considered, the Agency feels uncertain about the proper size categorization. The Agency is proposing that, for all plants that have a production of at least 100 tons per day of raw material processed, the BCT limitation be equal to the

existing BAT limitation. Additionally, the Agency is withdrawing the limitation for plants processing less than 100 tons per day of raw material. Comment is invited on the appropriate size cut-off.

(3) canned and preserved fruits, canned and preserved vegetables, canned and miscellaneous specialties: The BAT limitations for these subcategories are on a product by product basis. The model plants that were considered in these three subcategories are multi-product plants which the Agency determined, in its analysis pursuant to the promulgation of BAT guidelines, to be the most common types of plants. Therefore, the limitations were not evaluated on a product-by-product basis. Products produced by model plants are believed to be representative of every product regulated in the guidelines, and the Agency believes that the model plants exhibit typical costs and removals experienced by plants in the industry. Because some of the model plants exhibit reasonable costs while other multi-product plants exhibit unreasonable costs, it is not clear which product limitations are unreasonable and which product limitations are reasonable. Therefore, the Agency is withdrawing the BAT regulations for these three subcategories.

However, the evaluation of these subcategories determined that the tomato product limitations in canned and preserved fruits subcategory and the mushroom product limitations in the canned and preserved vegetables subcategory are reasonable. These products are often processed as the only product in one plant. Therefore, the PCT limitations for mushrooms and tomatoes are proposed equal to BAT.

The pH limitation is being retained at BCT for all subcategories.

Sugar Processing (40 CFR 409)

Pollutants Controlled: In all subcategories BOD5, TSS and pH are controlled. In the beet processing subcategory fecal coliform is also controlled. No non-conventional or toxic pollutants are controlled.

Methodology: Data for model plants in all of the subcategories are taken from the development documents published pursuant to the promulgation of BAT guidelines. This data includes information on production, waste water flow, pollutant load concentrations, pollutant load reduction at the BPT and BAT levels of control and the costs to achieve those levels of control.

The BAT effluent guideline limitation for the beet sugar processing subcategory requires a limitation of zero discharge for large plants. However, for large plants whose soil filtration rate is less than 1/16 inch per day, and for all small plants, a discharge was allowed. The zero discharge limitation was tested and found reasonable. It is assumed that for plants which have an allowable discharge the costs are less, and therefore, reasonable.

For the liquid and crystalline cane sugar refining subcategories, the original analysis assumes a reduced flow to meet BAT. The plant flow, considered in comparison to the POTW of a similar flow, is the flow after the plant has complied with BPT limitations.

Results: Three subcategories are considered in this review: beet sugar processing, crystalline cane sugar refining, and liquid cane sugar refining. The Hilo-Hamakua Coast of the Island of Hawaii raw cane sugar processing subcategory, the Louisiana raw cane sugar processing subcategory, and the Puerto Rican raw cane sugar processing subcategory do not have any BAT regulations in effect. The Florida and Texas raw cane sugar processing subcategory and the Hawaiian raw cane sugar processing subcategory have a BPT effluent limitation of zero discharge, consequently, no test of reasonableness is required.

For the three subcategories tested, controls of pH and fecal coliform are reasonable because the BAT guidelines do not require any additional control beyond BPT.

For two of the subcategories, beet sugar and liquid cane sugar refining, the BAT controls were found to be reasonable because the the model plants exhibited lower costs than POTWs with similar flows. Therefore, for these subcategories, the Agency is proposing that the BCT limitations guidelines be equal to the BAT limitations guidelines.

The analysis of the crystalline cane sugar refining subcategory showed that the small model plant (600 tons per day of melt) has unreasonable costs while the large model plant (2100 tons per day of melt) has reasonable costs. Therefore, the Agency is proposing BCT limitations equal to BAT for those plants processing 2100 tons per day of melt or more and withdrawing the controls for plants processing less than 2100 tons per day of melt. Comments are invited on this size cutoff.

Canned and Preserved Seafoods (40 CFR Part 408)

Pollutants Controlled: Total suspended solids and pH are controlled in all of the subcategories being tested. Most of the subcategories also have BAT controls in effect for BOD5, and oil and grease. There are no non-conventional or toxic pollutant controls.

Methodology: For each of the subcategories being tested, the data for small, large and, in some cases, medium size model plants is taken from the development document for that subcategory. This data includes information on production, waste water flow, pollutant concentration, pollutant removals at both BPT and BAT levels of control, and the costs to achieve those levels of control.

Five subcategories are excluded from the analysis because they do not have BAT limitations in effect. Those subcategories are Alaskan hand-butchered salmon processing, Alaskan mechanized salmon processing, Alaskan bottom fish processing, Alaskan scallop processing, and Alaskan herring fillet processing.

Fourteen subcategories (A through N) are excluded from the analysis due to the fact that there is not enough data to perform the analysis. The regulations for these subcategories will be suspended until sufficient data is available to perform the reasonableness test.

Results: The limitations for pH are reasonable for all subcategories because they are equal at the BPT and BAT levels. All of the subcategories tested were found to have reasonable BAT limitations for conventional pollutants. In the analysis of Subcategories O and AB, fish meal processing and sardine processing, the results show a split within the subcategories. In the sardine processing subcategory, one type of plant, using a dry transportation system from the sardine storage area in the plant to the processing area, has a stricter BPT limitation than those plants having a flume to transport the sardines. The BAT limitations for each type of plant are the same. As a result, the incremental pounds of pollutants removed from BPT levels to BAT levels were much lower for those plants with the dry transport system. Those plants with dry transport systems have a cost of removal which indicates that the conventional pollutant limitations are unreasonable for that process. The model plant cost for those plants with flume transport systems indicate that the conventional pollutant regulations are reasonable.

In the fish meal processing subcategory, those plants using a solubles plant to process bail and stick water can meet both BPT and BAT limitations through better housekeeping measures which involved minimal costs. Those plants without a solubles plant, however, are required to make a substantial investment to attain the

BAT level of control through installation of a solubles plant. However, in both subcategories (fish meal processing and sardine processing) the conventional levels of TSS at the BAT levels for both plant types are far above those levels allowed a comparable POTW. Because these concentrations at the BAT level of control are still very high, the regulations are reasonable.

Cement Manufacturing (40 CFR PART 411)

Pollutants Controlled: In all subcategories the conventional pollutants controlled are total suspended solids and pH. The non-leaching and leaching subcategories also have a temperature limitation.

Methodology: The data for the subcategory model plant is taken from the development document. The data includes information on production, waste water flow, pollutant loads and concentrations, pollutant load reduction at the BPT and BAT levels, and the costs to achieve those treatment levels.

Results: The leaching subcategory is the only subcategory which was tested and was found to have unreasonable limitations for TSS at the BAT level. The Agency is suspending the BAT control of TSS for this subcategory, but is retaining the control for pH, redesignating that control as BCT.

The subcategories non-leaching and materials storage piles runoff were not tested because both are under a BPT and BAT limitation of zero discharge. The Agency is proposing that the BCT limitation be zero discharge; the BAT zero discharge control is also being retained because it controls toxic and non-conventional pollutants.

Feedlots (40 CFR PART 412)

Pollutants Controlled: The pollutants BOD5 and fecal coliform are controlled under BPT in the ducks subcategory, although the BAT limitation is no discharge of process wastewater. In the other subcategory (all subcategories except ducks) the BPT and BAT limitations were zero discharge. There are no non-conventional or toxic pollutant controls.

Methodology: The only subcategory which had a stricter limitation at BPT than at BAT (ducks) is not amenable to the tests that are applied to other subcategories in this review. Although a discharge of conventional pollutants was allowed at BPT, the recommended technology to meet the zero discharge limit at BAT, is to install a confinement facility with a dry litter floor cover. Because the means to achieve the BAT limit of zero discharge is not the installation of a treatment technology, but a different method of raising ducks, a comparison to POTW costs and removals is not applicable. Because all other feedlots were required to achieve a zero discharge limit at BPT, the Agency has determined that this regulation is reasonable.

Results: Subcategory A (all subcategories except ducks) is excluded from the analysis because it is under a BPT and BAT limitation of zero discharge of process wastewater. This limitation will also be used as the BCT regulation.

The ducks subcategory was the only subcategory tested. It is found to have reasonable BAT limitations for process wastewater discharge. Therefore the Agency is proposing that the BCT limitation be equal to the existing BAT limitation. The other subcategory in this industry (all feedlots except ducks) already has a zero discharge limitation for BPT.

Both subcategories have limits on overflow during rainfall events. The Agency believes that Congress did not intend overflow limitations to be considered as part of this review and therefore reasonableness tests are not applied.

Fertilizer Manufacturing (40 CFR 418)

The phosphate subcategory has zero discharge limitations at both BPT and BAT. The effluent resulting from storm runoff also must be treated to certain levels of concentration. These concentration limits are equal at BPT and BAT. Therefore, the BCT limitation is being proposed equal to BAT.

The ammonium sulfate production and mixed and blend fertilizer production subcategories have zero discharge limitations at BPT and BAT. This same limitation is being proposed for BCT.

The urea and ammonium nitrate subcategories have been analyzed before this study and the BCT limits have been proposed. The only conventional pollutant regulated at BAT was pH which had the same control as BPT, and is therefore proposed as BCT.

The nitric acid subcategory has no conventional pollutant limitations in effect. Therefore, no BCT limitation is being proposed at this time.

Phosphate Manufacturing (40 CFR 422)

Pollutants Controlled: Total suspended solids, total phosphorous, and pH are the controlled conventional pollutants in this point source category. Flouride, a non-conventional pollutant is also controlled.

Methodology: Model plant data for the sodium phosphates subcategory (the only subcategory tested) is taken from the development document. The data included information on production, waste water flow, pollutant loading, pollutant load reduction at the BPT and BAT levels, and the costs associated with achieving those levels of control.

Results: The sodium phosphates subcategory is found to have reasonable BAT limitations for conventional pollutants. Although the incremental costs to meet BAT are not specified, the costs are estimated to be less than 5% of the costs to comply with BPT. Based on this estimate the cost per pound of TSS removed, if all costs were applied to the removal of TSS, is less than the cost of removal for a comparable POTW. Phosphorus is also controlled. A similar estimate for phosphorus indicates that if all costs were allocated to the removal of phosphorus the cost of control would be less than a POTW at comparable flow. Therefore the BCT control of TSS, phosphorus, and pH is being proposed to be equated to BAT control.

The deflourinated phosphate rock and deflourinated phosphoric acid subcategories have BAT limitations which are equal to their BPT limitations. The Agency is proposing that the BCT limitations be equal to the BAT limitations for conventional pollutants. No other subcategories have regulations which are in effect.

Ferroalloy Manufacturing (40 CFR Part 424)

Pollutants Controlled: In all subcategories tested, the controlled conventional pollutants are total suspended solids and pH. Toxic pollutants, including chromium, manganese, cyanide and phenols are also controlled, in most subcategories.

Methodology: The data for a model plant for each subcategory is from the development documents. All data on model plant production, waste water flow, pollutant loading, and pollutant control levels is taken from those development documents.

Results: Of the six subcategories analyzed as to the reasonableness of their respective conventional pollutant BAT limitations, three are reasonable and three unreasonable. The three reasonable subcategories are: Subpart A, open electric furnaces and other smelting operations with wet air pollution control devices; Subpart B, covered electric furnaces and other smelting operations with wet air pollution control devices; and Subpart C, slag processing.

The three unreasonable subcategories are: Subpart D, covered calcium carbide furnaces with wet air pollution control devices; Subpart F, electrolytic manganese products; and Subpart G, electrolytic chromium. Subpart E, other calcium carbide furnaces, has a BPT and BAT limitation of zero discharge and is, therefore, not included in the analysis. The BCT limitation is being proposed as zero discharge for this subcategory.

In subcategory B, covered electric furnaces and other smelting operations with wet air pollution control devices, the initial results show the conventional pollutant regulations to be unreasonable by a small amount assuming all costs are allocated to conventional pollutants. However, further investigation shows a significant amount of the cost of the BAT limitations to be for the control of toxic pollutants (chromium, manganese, cyanide and phenols). Allocating the total cost of control to conventional pollutants in this case is not realistic. The Agency believes that a reasonable allocation of costs between toxic and conventional pollutants would indicate that the resulting cost per pound of conventional pollutant removed would be reasonable. Therefore, the Agency is proposing that the BCT limitations for this subcategory be equal to the BAT limitations for conventional pollutants. The allocation of costs in subcategories D, F and G is not possible with any confidence. Because of this, the regulations for conventional pollutants are declared unreasonable.

The EPA suspects that suspended solids in this industry may be an indicator of toxic pollutants. Because of this, a review of the suspended solids limitations may take place to determine if there is sufficient data for control of toxic pollutants, possibly using solids as an indicator.

Glass Manufacturing (40 CFR PART 426)

Pollutants Controlled: Total suspended solids and pH are controlled in all subcategories. Three subcategories have increased controls for oil, while one subcategory has increased controls of phosphorus. Additionally, three subcategories control other pollutants such as flouride and lead.

Methodology: Data for a model plant for each subcategory tested is from the industry development documents. This data includes information on production, waste water flow, pollutant concentrations, treatment costs to achieve the BPT and BAT limitations as well as the pollutant load reductions for each level of control.

Results: The BPT limitation for insulation fiberglass is zero discharge. However, a discharge is allowed for air pollution control devices where there are limitations for conventional pollutants and phenol (a toxic pollutant) in effect. The BAT limitation is zero discharge. Because toxics are controlled and the limitation is zero discharge, BCT is being proposed equal to BAT.

The sheet glass and rolled glass subcategories are not analyzed because the BPT limitation is zero discharge. BCT is being proposed as zero discharge for these subcategories.

The plate glass subcategory is the only subcategory of those tested to be found reasonable. The Agency is proposing that the BCT control of conventional pollutants be equal to the BAT control of conventional pollutants.

All other subcategories (float glass manufacturing, automotive glass tempering, automotive glass laminating, glass container manufacturing, television picture tube envelope manufacturing, incandescent lamp envelope manufacturing, and hand pressed and blown glass manufacturing) were found to be unreasonable and it is being proposed that the BAT control of conventional pollutants be withdrawn. In the hand pressed and blown glass subcategory no cost information was available for the analysis. However, the technology and pollutant loads are similar to the rest of the unreasonable subcategories. On that basis, it is assumed that costs would be similar, and unreasonable.

Meat Products (40 CFR PART 432)

Pollutants Controlled: In all subcategories tested the conventional pollutants controlled are TSS, BOD_5, oil and grease and pH. Ammonia, a non-conventional pollutant, is also controlled in all subcategories. However, the ammonia limitation has been remanded in the simple slaughterhouse, complex slaughterhouse, low processing packinghouse and high processing packinghouse subcategories.

Methodology: The data for model plants for each subcategory is from the development documents for the regulations. The data includes information on production, waste water flow, pollutant concentrations, pollutant reductions at the BCT and BAT levels of control, and the costs to achieve those levels of control for each model plant. To properly determine the reasonableness of these regulations, the entire list of BAT limitations, and the necessary technologies and costs associated with them, must be taken into account as a whole. For Subparts A through D, part of the regulation (the limitations for ammonia) has been remanded to the agency for further study pursuant to the U.S. Court of Appeals for the 7th Circuit decision in American Meat Institute v. EPA (526 F 2d 422). In these subcategories the Agency cannot properly determine the reasonableness of the regulations. Therefore, the Agency is proposing to suspend the conventional pollutant limitations at BAT. The reasonableness of these regulations will be determined in the work performed pursuant to the remand of the ammonia limitations. At the time of proposal of new ammonia limitations, the findings on the reasonableness of the conventional pollutant limitations will be presented.

Results: In the six subcategories tested, all were found to have reasonable conventional pollutant limitations at the BAT level of control. In subcategories E through J, which are examined as to reasonableness, the costs of BAT controls are totally attributable to the removal of ammonia, a non-conventional pollutant. Since the removal of ammonia requires that BOD_5 and TSS also be reduced, there is no cost attributable to the removal of conventional pollutants. Therefore, the cost of conventional pollutant removal is zero and the limitations are reasonable. The Agency is proposing that the BCT limitations for subcategories E through J be equal to the BAT limitations.

Five additional subcategories have no regulations in effect and have been excluded from the analysis. They are the chicken, turkey, fowl, duck, and further processing subcategories.

Other Industries

There are industrial categories and subcategories, other than those listed previously, that are not tested for reasonableness. These categories were excluded from the analysis because they do not have any regulations in effect, or have only BPT regulations in effect.

The industrial categories which have no regulations in effect are: Water Supply; Miscellaneous Foods and Beverages; Transportation; Fish Hatcheries and Farms; Steam Supply; Clay, Gypsum, Refractory, and Ceramic Production; Concrete Products; and Shore Receptors and Bulk Terminals.

Three additional industrial categories have in effect only the

BPT limitations. These are Offshore Oil and Gas Extraction, Hospitals, and Mineral Mining and Processing. The Mineral Mining and Processing category also has some subcategories which have no limitations in effect.

The Asbestos industrial category has a BAT limitation of zero discharge in seven subcategories. These subcategories are not analyzed because the zero discharge limit is for the control of toxic pollutants and is not subject to review.

TABLE D1
SUMMARY OF DATA

COLUMN		1	2	3	4					5				
INDUSTRY Subcategory		Model Plant Flow (MGD)	Model Plant $/Lb.	Comparable POTW $/Lb.	BAT Model Plant Concentration (mg/l)					POTW Concentration (mg/l)				
					BOD	TSS	O&G	P	COD	BOD	TSS	O&G	P	COD
DAIRY														
1. Receiving Stations	s	.01	.58	1.72	8	10								
	l	.04	1.55	1.60	5	7								
2. Fluid Prod.	s	.07	.12	1.51	12	15								
	l	.30	.76	.82	8	10								
3. Cultured Prod.	s	.02	.29	1.68	12	15								
	l	.07	.99	1.51	8	10								
4. Butter	s	.01	.26	1.72	13	16								
	l	.04	.59	1.60	8	10								
5. Cottage, Cream Cheese	s	.01	.35	1.72	13	16								
	l	.06	1.06	1.54	8	10								
6. Natural, Proc. Cheese	s	.01	.61	1.72	13	16								
	l	.02	1.21	1.68	8	10								
7. Fluid Mix for Ice Cream	s	.01	.38	1.72	15	19								
	l	.05	.98	1.58	10	12								

COLUMN	1	2	3	4					5				
INDUSTRY Subcategory	Model Plant Flow (MGD)	Model Plant $/Lb.	Comparable POTW $/Lb.	BAT Model Plant Concentration (mg/l)					POTW Concentration (mg/l)				
				BOD	TSS	O&G	P	COD	BOD	TSS	O&G	P	COD
8. Ice Cream, Frozen Desserts	s .03	.31	1.64	13	17								
	l .11	.92	1.35	9	11								
9. Condensed Milk	s .03	.35	1.64	13	16								
	l .11	1.09	1.35	8	10								
10. Dry Milk	s .02	1.63	1.68	13	16								
	l .08	1.05	1.47	8	10								
11. Condensed Whey	s .01	.76	1.72	14	17								
	l .04	1.38	1.60	9	11								
12. Dry Whey	s .01	.39	1.72	14	17								
	l .05	.80	1.58	9	11								
GRAIN MILLS													
13. Corn Wet Milling	s 1.5	.13	.89	48	72								
	m 3.0	.10	.87	48	72								
	l 4.5	.09	.85	48	72								
14. Corn Dry Milling	s .07	.85	1.51	56	28								
	l .13	.56	1.28	57	28								

COLUMN	1	2	3	4					5				
				BAT Model Plant Concentration (mg/l)					POTW Concentration (mg/l)				
INDUSTRY Subcategory	Model Plant Flow (MGD)	Model Plant $/Lb.	Comparable POTW $/Lb.	BOD	TSS	O&G	P	COD	BOD	TSS	O&G	P	COD
15. Bulgar Wheat Rice	.015	22.00	1.68	20	14				30	60			
16. Parboiled Rice	.13	1.02	1.28	52	21								
17. Ready-to-Eat	s .140	.76	1.25	34	26								
	m .350	.57	.77	34	26								
	l .440	.45	.67	34	26								
18. Wheat Starch and Gluten	.120	.20	1.32	50	40								
CANNED AND PRESERVED FRUITS & VEGETABLES													
19. Apple Juice	s .07	1.16	1.51	35	35								
	l .35	.62	.77	35	35								
20. Apple Products	s .13	1.79/3.74	1.28	19	19				30	60			
	l 1.29	.35	.90	19	19								

COLUMN	1	2	3	4					5				
	Model Plant Flow	Model Plant	Comparable POTW	BAT Model Plant Concentration (mg/l)					POTW Concentration (mg/l)				
INDUSTRY Subcategory	(MGD)	$/Lb.	$/Lb.	BOD	TSS	O&G	P	COD	BOD	TSS	O&G	P	COD
21. Citrus Products	s .97	.39	.37	7	10				30	60			
	l 9.7	.13	.77	7	10				30	30			
22. Frozen Potato	s 1.08	.15	.90	15	49								
	l 2.71	.12	.87	15	49								
23. Dehydrated Potato	s .42	.20	.69	20	63								
	l 1.26	.13	.90	20	63								
24. Canned & Pres. Fruits*													
25. Canned & Pres. Vegetables*													
Mushrooms	s .037	1.59	1.60	30	61								
	l .074	1.08	1.51	30	61								
Sauerkraut	s .014	6.18	1.72	36	73				30	60			
	l .022	4.38	1.68	36	73				30	60			
Tomatoes	s .147	.91	1.20	35	35								
	l .882	.40	.42	35	73								

*Model plants for subcategories 24 and 25 are multi-product plants which cover regulations from both of these subcategories.

COLUMN		1	2	3	4					5				
					BAT Model Plant Concentration (mg/l)					POTW Concentration (mg/l)				
INDUSTRY Subcategory		Model Plant Flow (MGD)	Model Plant $/Lb.	Comparable POTW $/Lb.	BOD	TSS	O&G	P	COD	BOD	TSS	O&G	P	COD
Corn, Peas	xs	.024	2.32	1.68	48	48				30	60			
	s	.095	1.44	1.41	48	48				30	60			
	m	.294	1.15	.83	48	48				30	60			
	l	.952	0.51	.38	48	48				30	60			
Corn, Peas,	s	.084	.98	1.47	40	40								
Green Beans,	m	.212	1.19	1.01	40	40				30	60			
Carrots	l	.424	.90	.69	40	40				30	60			
Frozen Corn,	xs	.092	.94	1.43	35	35								
Peas, Green	s	.165	1.65	1.14	35	35				30	60			
Beans,	m	.229	1.44	.94	35	35				30	60			
Carrots	l	.459	1.10	.65	35	35				30	60			
Brocolli,	s	.252	1.93	.89	14	26								
Spinach,	m	.787	1.14	.46	14	14				30	60			
Lima Bean,	l	1.259	.90	.90	31	31								
Cauliflower														

COLUMN		1	2	3	4					5				
INDUSTRY Subcategory		Model Plant Flow (MGD)	Model Plant $/Lb.	Comparable POTW $/Lb.	BAT Model Plant Concentration (mg/l)					POTW Concentration (mg/l)				
					BOD	TSS	O&G	P	COD	BOD	TSS	O&G	P	COD
Tomato, Dry Bean	xs	.062	.75	1.54	32	64								
	s	.177	1.21	1.12	31	31				30	60			
	m	.619	.69	.55	31	31				30	60			
	l	1.106	.52	.90	31	31								
Cherry, Green Bean, Pear, Plum	s	.021	2.21	1.68	40	80				30	60			
	m	.066	.90	1.51	40	86				30	60			
	l	.120	2.07	1.32	40	86				30	60			
Cherry, Caneberry, Strawberry	s	.012	6.30	1.72	17	65				30	60			
	l	.029	1.40	1.64	32	65								
26. Canned & Misc. Specialities														
Potato Chips	xs	.039	2.67	1.60	10	31				30	60			
	s	.123	1.32	1.32	10	31								
	m	.200	1.38	1.04	10	31				30	60			
	l	.463	.86	.65	10	31				30	60			

COLUMN	1	2	3	4	5
INDUSTRY Subcategory	Model Plant Flow (MGD)	Model Plant $/Lb.	Comparable POTW $/Lb.	BAT Model Plant Concentration (mg/l) BOD TSS O&G P COD	POTW Concentration (mg/l) BOD TSS O&G P COD
CANNED AND PRESERVED SEAFOODS					
27. Farm Raised Catfish					
28. Conv. Blue Crab					
29. Mech. Blue Crab					
30. Non-Remote Alaskan Crab					
31. Remote Alaskan Crab	DATA NOT AVAILABLE, REGULATIONS BEING SUSPENDED				
32. Non-Remote Alaskan Whole Crab					
33. Remote Alaskan Whole Crab					
34. Dungesness and Tanner Crab					
35. Non-Remote Ala. Shrimp					
36. Remote Ala. Shrimp					
37. Northern Shrimp					
38. Southern Non-Breaded Shrimp					

COLUMN		1	2	3	4					5				
INDUSTRY Subcategory		Model Plant Flow (MGD)	Model Plant $/Lb.	Comparable POTW $/Lb.	BAT Model Plant Concentration (mg/l)					POTW Concentration (mg/l)				
					BOD	TSS	O&G	P	COD	BOD	TSS	O&G	P	COD
39. Breaded Shrimp														
40. Tuna														
41. Fish Meal w/out solubles plant		.13	1.17	1.28	1240	489	248							
42. West Coast Butchered	s	.009	1.58	1.72	333	39	5							
Salmon	l	.03	.70	1.64	333	39	5							
43. West Coast Mechanized	s	.068	.13	1.51	859	134								
Salmon	l	.179	.09	1.12	859	134								
44. Non-Alaskan	s	.014	.34	1.72	122	126	7							
Conv. Bottom	m	.032	.24	1.64	122	126	7							
Fish	l	.06	.15	1.54	122	126	7							
45. Non-Alaskan														
Mech. Bottom	s	.024	.27	1.68	415	130	43							
Fish	l	.087	.08	1.43	415	130	43							

COLUMN		1	2	3	4					5				
					BAT Model Plant Concentration (mg/l)					POTW Concentration (mg/l)				
INDUSTRY Subcategory		Model Plant Flow (MGD)	Model Plant $/Lb.	Comparable POTW $/Lb.	BOD	TSS	O&G	P	COD	BOD	TSS	O&G	P	COD
46. Hand-Shucked Clam		No costs (except housekeeping) associated with meeting BAT												
47. Mech. Clam	s	.13	.01	1.28	836	646	14							
	l	.43	.01	.68	836	646	14							
48. Pacific Hand-Shucked Oyster		No costs (except housekeeping) associated with meeting BAT												
49. Atlantic & Gulf Hand-Shucked Oyster		No costs (except housekeeping) associated with meeting BAT												
50. Steamed & Canned Oyster		.11	.03	1.35	272	624	8							
51. Sardine Dry Process	s	.029	7.84	1.64		1380	75			30	60			
	m	.077	4.79	1.47		1380	75			30	60			
	l	.116	3.96	1.32		1380	75			30	60			
Wet Process	s	.029	.83	1.64		1380	75							
	m	.077	.51	1.47		1380	75							
	l	.116	.42	1.32		1380	75							
52. Non-Alaskan Scallop		No costs (except housekeeping) associated with meeting BAT												

COLUMN	1	2	3	4					5				
				BAT Model Plant Concentration (mg/l)					POTW Concentration (mg/l)				
INDUSTRY Subcategory	Model Plant Flow (MGD)	Model Plant $/Lb.	Comparable POTW $/Lb.	BOD	TSS	O&G	F	COD	BOD	TSS	O&G	P	COD
53. Non-Alaskan Herring Fillet	.37	.04	.73	709	206	83							
54. Abalone Proc.	No costs (except housekeeping) associated with meeting BAT												
SUGAR PROCESSING													
55. Beet Sugar	9.4	.03	.77	0	0								
56. Crystalline Cane Sugar	s 5.1 l 17.9	.91 .58	.84 .65	51 40	15 15								
57. Liquid Cane Sugar	2.3	.64	.87	75	15								
CEMENT MANUFACTURING													
58. Leaching	.13	4.49	1.28	Essentially Zero Discharge									
FEEDLOTS													
59. Ducks				(Not Amenable to Analysis)									

COLUMN	1	2	3	4					5				
				BAT Model Plant Concentration (mg/l)					POTW Concentration (mg/l)				
INDUSTRY Subcategory	Model Plant Flow (MGD)	Model Plant $/Lb.	Comparable POTW $/Lb.	BOD	TSS	O&G	P	COD	BOD	TSS	O&G	P	COD
FERROALLOYS													
60. Open Electric Furnaces Wet	.123	.84	1.32		15								
61. Covered Electric & Smelting Wet	.365	.83	.74		15				30	60			
62. Slag Proc.	.250	.02	.89		25								
63. Covered Calcium Carbide Wet	1.1	1.58	.90		15				30	30			
64. Elect. Manganese	.65	1.45	.53		25				30	60			
65. Elect. Chromium	1.0	1.98	.91		25				30	30			
GLASS MANUFACTURING													
66. Ins. Fiberglass	BAT Technology applies to wastewater of wet scrubbers only, costs and removals not available												
67. Plate	7.3	.33	.80		30								
68. Float	.05	14.42	1.58		15	5			30	60			
69. Auto Tempering	.18	2.88	1.12		5	5			30	60			
70. Auto. Laminating	.14	5.58	1.25		5	5	1		30	60			

COLUMN	1	2	3	4					5				
INDUSTRY Subcategory	Model Plant Flow (MGD)	Model Plant $/Lb.	Comparable POTW $/Lb.	BAT Model Plant Concentration (mg/1)					POTW Concentration (mg/1)				
				BOD	TSS	O&G	P	COD	BOD	TSS	O&G	P	COD
71. Container	.35	3.80	.77		25	25			30	60			
72. Tubing	.20	2.76	1.04		10				30	60			
73. TV Picture Tube	.82	8.56	.45		10	10			30	60			
74. Incandescent Lamp Envelope	.189	26.29	1.08		7	3			30	60			
75. Hand Pressed & Blown	Costs Unknown					10							
ASBESTOS													
76. Cement Pipe													
77. Cement Sheet													
78. Paper (Starch Binder)													
79. Paper (Elastomeric Binder)	Not part of BCT review because conventional pollutants are toxic indicators												
80. Roofing													
81. Floor Tile													
82. Wet Dust Col.													

COLUMN	1	2	3	4					5				
INDUSTRY Subcategory	Model Plant Flow (MGD)	Model Plant ¢/Lb.	Comparable POTW ¢/Lb.	BAT Model Plant Concentration (mg/l) BOD	TSS	O&G	P	COD	POTW Concentration (mg/l) BOD	TSS	O&G	P	COD
MEAT PRODUCTS													
83. Simple Slaughterhouse													
84. Complex Slaughterhouse		Regulations remanded by courts											
85. Low Proc. Packinghouse													
86. High Proc. Packinghouse													
87. Small Proc.		No costs associated with meeting BAT											
88. Meat Cutter		Costs not available		30	40	20							
89. Sausage and Luncheon	.098	0	1.39	29	40	20			30	60			
90. Ham Proc.	.11	0	1.35	30	40	21			30	60			
91. Canned Meats	.24	0	.92	30	39	24			30	60			
92. Renderers	.09	0	1.47	28	34	15			30	60			
PHOSPHATES													
93. Sodium Phosphates		Minimal costs associated with meeting BAT.											

xs = Extra Small Size Model Plants
s = Small Size Model Plants
m = Medium Size Model Plants
l = Large Size Model Plants

APPENDIX E

The Agency considered other alternatives for determining reasonableness of BAT effluent limitation guidelines. The following is a discussion of these alternatives:

Average Annual Pollution Control Cost per Pound of Pollutant Removed ($/lb.)

This alternative is identical to the one that was chosen except that an average cost to meet BAT is used. Instead of determining the cost of removal of the increment from BPT to BAT, the average cost of treatment from raw waste load to BAT is determined. The effect of this alternative is that in almost all cases the average cost would be less than the incremental cost because the cost of removing the last 'expensive' pounds would be averaged with the cost of removing the first 'cheap' pounds. In all other respects this approach is no different from the approach proposed. Therefore more subcategories would be determined reasonable.

This alternative was rejected because the legislative history indicates the Act's intent was not to review the reasonableness of BPT controls. The concept of reasonableness is limited to the incremental costs and reduction to achieve BAT. This is reinforced by the legislative history which specifies that under no circumstances should BCT be less stringent than BPT.

Incremental Annual Pollution Cost per Volume Unit of Discharge ($/1,000 Gallons Discharged)

This criterion was considered because it avoids the pollution cost allocation problem as discussed in the preamble. Because it measures volume rather than wasteload, it is independent of the number of types of wastes present in the discharge.

Although, pollution investment costs are driven by discharge volume and this criterion links these two variables, the important measure of pollution reduction is not the volume of discharge treated but the amount (i.e. pounds) of waste abated. Clearly, incremental annual cost per volume unit of water treated does not provide this measure. For this reason, this criterion was rejected.

<u>Measure of the Plant Pollutant Incremental Reduction Efficiency (%)</u>

Pollutant reduction efficiency is a measure of the amount of pollutant removed from the waste. The increment in this criterion is from BPT to BAT. This criterion is a relative measure of pollution reduction and it is not dependent on firm size.

However, this criterion has one major drawback: it does not measure the actual amount of pollutant reduction, and therefore can lead to wrong conclusions. While the increment in percentage pollution removal may be very large to meet BAT regulations for a plant, the actual amount of pollution removal may be small. The amount of reduction depends on the amount of waste in the discharge. Because this criterion does not measure the absolute amount of pollution, it was rejected as a criterion for reasonableness.

Pollution Control Investment to Book Value Ratio (C/B)

This criterion is formed from the ratio of pollutant investment costs to book value of the plant (Book value is the cost of all existing investment less total depreciation). This criterion, in a general way, measures the likelihood that the pollution control equipment can be financed. In this respect then, it is another measure of the "economic achievability" of the regulation. This was already considered in the initial development and promulgation of the BAT regulation. For this reason, this alternative was rejected.

Plant Closures

Plant closures are not considered to be a reliable measure of all financial impacts of pollution control. Plants stay open until profitability is low enough to force closures. It is not a continous function. Therefore a plant's financial condition can be seriously affected and it will still remain open until the threshold is reached.

Additionally plants may remain open for other financial reasons. The plant may be a part of a larger firm which projects long-term profits. The plant may be a family business and also have the ability to absorb losses in the short-term. The opportunity costs for using the fixed assets may be low and the plant may be better off remaining open.

Additionally, this criterion was considered in the promulgation of BAT guidelines, and the number of estimated closures was minimized. Many times less costly regulations were promulgated due to the number of estimated plant closures projected as a result of the use of a higher cost technology. For these reasons, this alternative was rejected as a factor in determining reasonableness.

<u>After Tax Return On Investment (ROI); Change in ROI; Percent Change in ROI.</u>

Return on investment is the plant's profit or (net income) on each dollar of investment. Investment in water pollution control equipment generally reduces the **firm's** ROI because there is no monetary 'return' to the firm on this investment, although society as a whole receives a return which is manifested by clean water. ROI is reduced first by imposition of BPT, and again by the additional imposition of BAT controls. Therefore, ROI measures the change in the plant's profitability and is an indicator of the plant's financial ability to comply with pollution control regulations. Unlike the closure criterion, it is a continuous function of financial impact. A unit change in ROI indicates a definite change in the financial position of the firm.

Most economic impact criteria are in some manner reflections of changes in ROI. For example, only if ROI is severely impacted will plants be forced to close.

Although absolute changes in ROI indicate that the plant is being impacted, they do not measure the size of the impact on the plant. Two plants may experience a five percent decrease in ROI, but one plant may have initial ROI of 20 percent while the second may have an initial ROI of 10 percent. The first firm suffers relatively less change in profitability than the second.

In addition, looking only at ROI does not reflect the tradeoff between pollution reduction and economic impacts. Only if pollution reduction measures (e.g. changes in concentration) are simultaneously considered will the economic impact (change in ROI) be compared to the benefits (changes in concentration) derived.

This alternative was considered, but was rejected for a number of reasons. The quality of data required to perform this analysis is not available or, in many cases, does not exist. Also, this test of reasonableness is a complex economic definition, and thus difficult to explain and apply. Additionally, there is no benchmark of reasonableness. Although other criteria exhibited this same characteristic, it can be solved by comparisons to POTWs. In addition, for this criterion, POTWs do not have an analagous return on investment. Lastly, economic impacts were already considered in the development of BAT guidelines.

Estimated Price Increase Needed to Recover Annual Pollution Investment Costs

This alternative was examined, but ultimately rejected. Price increases were considered in the development of BAT guidelines, they are a measure of consumer impact, not firm impact, and in many cases the stated price increases were trivial or zero.

POTW Comparisons

One of the criteria for determining reasonableness specifically suggested by Congress was the comparison of costs of pollutant removal by industry with costs of pollutant removal by municipal treatment systems. The underlying premise for an approach of this type is that municipal treatment systems being built with public funds remove conventional pollutants at a reasonable cost. If an industry removes pollutants at a similar or lower cost, then the pollutant removal required of industry will also be reasonable. The concept is straightforward enough, but the manner in which the industrial and municipal costs are developed and compared can vary significantly depending on the approach used.

One of the major factors affecting a comparison of industrial treatment costs with those of a POTW is the type of cost that is compared. The most fundamental cost that might be compared is the average cost of removing pollutants. This cost is relatively simple to estimate by dividing the total annual cost of pollutant removal by the mass of pollutants removed. Although there is good data for these types of calculations and comparisons, there is little economic theory supporting decisions based on this type of comparison. Using average costs tends to cause more regulations to remain reasonable as compared to the incremental approach discussed below. Economic theory does, however, support the use of comparing marginal costs. Society, if in equilibrium, will have best allocated its resources to obtain some level of pollution control where the marginal cost of removing a specified pollutant is the same wherever it is being removed. Based on our premise that the cost of pollutant removal by POTW's is reasonable, the marginal cost of removal is also reasonable. Thus, it is the marginal cost of removal in both the industrial treatment systems and the POTWs that should be compared. Obtaining accurate estimates of marginal costs can be difficult and are usually approximated by the use of increments. This is, in fact, what has been done in this review. The expected incremental costs of removal by industry are compared to the incremental cost of removal by POTWs.

Another important factor affecting a comparison of industrial and POTW pollutant removal costs is the type of POTW on which the costs are based. The incremental costs of pollutant removal generally decrease as the size of the POTW increases due to economics of scale, so that the selection of the size is very critical in developing a criterion by which to judge reasonableness. One approach would be to estimate incremental costs of removal based on a POTW treating the mean flow of all POTWs. This approach yields an average marginal cost of pollutant removal from all sewage. Our original premise that POTWs generally remove pollutants at a reasonable cost would indicate, however, that many smaller POTWs are removing pollutants at reasonable, though higher, costs. Thus, a POTW of average flow does not provide a criterion for judging reasonableness. The same argument holds for POTWs

of median flow size. The alternative that has been chosen is to develop the POTW incremental cost based on a POTW of the same flow as the industrial flow. This ensures a degree of comparability in the incremental costs.

The third major factor in developing a POTW cost comparison to test for reasonableness is the degree of aggregation for which industrial incremental costs are developed. One extreme would be to estimate the incremental cost of pollutant removal for each plant covered by each regulation and compare that cost to the cost of pollutant removal at POTWs. The other end of the spectrum is to determine one incremental cost for all industries covered by this secondary industry review and compare that cost to the cost of pollutant removal by POTWs review. The problem with both of these levels of aggregation is that the costs would not correspond to any specific regulations under review. The level of aggregation that the Agency has chosen is to consider the incremental cost for the group of pollutants covered by model plants that were originally developed to evaluate the economic effects of the BAT regulations.

APPENDIX F

EPA Regional and Headquarters Libraries

Region I Library
Room 2211 - B, JFK Federal Bldg.
Boston MA 02203

Region II Library
26 Federal Plaza
New York NY 10007

Region III Library
Curtis Bldg., 6th & Walnut Streets
Philadelphia PA 19106

Region IV Library
345 Courtland Street N.E.
Atlanta GA 30308

Region V Library
230 Dearborn Street Room 1417
Chicago IL 60604

Region VI Library
1201 Elm Street, First International Bldg.
Dallas TX 75270

Region VII Library
1735 Baltimore Avenue Room 249
Kansas City MO 64108

Region VIII Library, 8M-ASL
1860 Lincoln Street
Denver CO 80295

Region IX Library
215 Fremont Street
San Francisco CA 94105

Region X Library
1200 Sixth Avenue
Seattle WA 98101

Headquarters Library, Room 2404 PM-213
401 M Street, SW
Washington DC 20460

TAB 8

Effluent Guidelines
Model Plant Analyses Summaries

The effluent guidelines for each of the subcategories are presented as shown in 40 CFR Subchapter N. They are arranged in order of 40 CFR Part number and labeled as to their applicability by industry and subcategory.

Presented with the guidelines is information on the raw waste load of the subcategory, in pounds of pollutant per unit of production and as mg/l concentration. Also included is the percentage removal of each pollutant from the raw waste load level at both the BPT and BAT levels of technology.

In addition to each subcategory's guidelines, a summary of the data used in the model plant analysis for that subcategory is presented in the following form.

Column 1 - Model Plant Flow of wastewater in millions of gallons per day.

Columns 2, 5, 8 - The annual costs, in millions of 1976 dollars, of the technology used to meet the effluent guidelines for the model plant. These costs include operation and maintenance, capital costs and depreciation. Column 2 contains the annual costs for BPT. Column 5 the incremental costs above BPT costs to achieve BAT and Column 8 gives the total of both BPT and BAT costs.

Columns 3, 6, and 9 - The millions of pounds of suspended solids and oxygen demanding pollutants removed annually as a result of controls. In most cases, BOD and TSS removals were added together to arrive at an annual measure of conventional pollutant removal. There are cases, however, in which one, or both, of these pollutant measures is not a control parameter for a subcategory. In these cases, the annual pounds of removal of conventional pollutants is measured by using substitute parameters. Where TSS is not controlled, there is no suspended solid component suitable for substitution. Therefore, the TSS component of the removals is assumed to be zero. Where BOD is not controlled, there are two substitute measures of oxygen demanding conventional pollutants which can be used as substitutes. Chemical Oxygen Demand removal or oil and grease removal, in that order of preference. In no case shall the measures be combined. Any combining of the BOD, COD or oil and grease measures would result in double-counting of oxygen demanding substances and lead to an artificially high removal measure. This would drive the cost per pound to an artificially low level.

Columns 4, 7, and 10 - The cost per pound of pollutant removal. This is derived using the costs of technology levels and dividing those costs by the annual pounds of removal for those levels of technology. The costs listed may not match those calculated using the figures in the table due to rounding.

The data for each of the industry categories were taken from the documents listed below.

1. Dairy Products
   Dairy Products Processing — EPA 440/1-74-021-a

2. Grain Mills
   Grain Processing — EPA 440/1-74-028-a
   Animal Feed, Breakfast Cereal and Wheat Starch — EPA 440/1-74/039-a
   Corn Wet Milling — EPA 440/1-78/028-b Supplement

3. Fruits and Vegetables
   Apple, Citrus and Potato Products — EPA 440/1-74-027-a
   Economic Analysis of the Fruits and Vegetables Category (Phase II) — EPA 230/1-75-036 Supplement II March, 1977

4. Seafood
   Fish Meal, Salmon, Bottom Fish Clam, Oyster, Sardine, Scallop, Herring, and Abalone — EPA 440/1-75/041-a

5. Sugar Processing
   Beet Sugar Processing — EPA 440/1-74-002-b
   Cane Sugar Processing — EPA 440/1-74-002-c

6. Cement Manufacturing
   Cement Manufacturing — EPA 440/1-74-005-a

7. Feedlots
   Feedlots — EPA 440/1-74/004-a

8. Phosphate Manufacturing
   Other Non-Fertilizer Phosphate Chemicals — EPA 440/1-75/043-a

9. Ferroalloys

Smelting and Slag Processing	EPA 440/1-74/008-a
Calcium Carbide	EPA 440/1-75/038

10. Glass Manufacturing

Pressed and Blown Glass	EPA 440/1-75-034-a
Flat Glass	EPA 440/1-74-001-c
Insulation Fiberglass	EPA 440/1-74-001-b

11. Meat Products

Red Meat Processing	EPA 440/1-74-012-a
Processor	EPA 440/1-74/031
Independent Rendering	EPA 440/1-77/031-e Supplement

INDUSTRY: Dairy Products Processing

SUBPART A: Receiving Stations

I. Effluent Guidelines

Raw Waste Load			BPT Regulations 40 CFR 405.12 Promulgated: May 28, 1978 Amended:				BAT Regulations 40 CFR 405.13 Promulgated May 28, 1974 Amended:			
			(a) For receiving stations receiving more than 150,000 lb/day of milk equivalent (15,600 lb/day or more of BOD 5 input)				(a) For receiving stations receiving more than 150 lb/day of milk equivalent (15,600 lb/day or more of BOD5 input)			
	lbs/u*	mg/l		lbs/u*	mg/l	% rem		lbs/u*	mg/l	% rem
BOD5	.164	175	BOD5	.019	32	88.4	BOD5	.005	30	97.0
TSS	.047	31	TSS	.029	30	38.3	TSS	.006	30	87.2
			pH	Within the range of 6.0 to 9.0			pH	Within the range of 6.0 to 9.0		
			(b) For receiving stations receiving 150,000 lb.day or less of milk equivalent (under 15,600 lb/day of BOD5 input)				(b) For receiving stations receiving 150,000 lb.day or less of milk equivalent (under 15,600 lb/day of BOD5 input)			
				lbs/u*	mg/l	% rem		lbs/u*	mg/l	% rem
BOD5	.164	173	BOD5	.031	32	81.1	BOD5	.008	30	95.1
TSS	.047	31	TSS	.047	30	0.0	TSS	.009	30	80.9
			pH	Within the range of 6.0 - 9.0			pH	Within the range of 6.0 - 9.0		

* 100 lbs of BOD5 input

INDUSTRY: Dairy Products
SUBCATEGORY A: Receiving Stations

2. MODEL PLANT ANALYSIS SUMMARY

	BPT			BAT			TOTAL		
Plant Flow (MGD)	Annual Cost Millions	Lbs BOD + TSS Removed Millions	$/Lb.	Incremental Annual Cost Millions	Incremental Lbs BOD + TSS Removed Millions	Incremental $/Lb.	Total Annual Cost Millions	Total Lbs BOD + TSS Removed Millions	Total $/Lb.
Small .01	0.036	0.004	9.67	0.001	0.002	0.58	0.037	0.005	6.79
Large .04	0.044	0.018	2.42	0.006	0.004	1.55	0.051	0.022	2.26

INDUSTRY: Dairy

SUBPART B: Fluid Products

I. Effluent Guidelines

Raw Waste Load	BPT Regulations 40 CFR 405.22 Promulgated: May 28, 1974 Amended: Sept. 13, 1974	BAT Regulations 40 CFR 405.23 Promulgated May 28, 1974 Amended:
	(1) For fluid products plants receiving 250,000 lb/day or less of milk (less than 25,900 lb/day of BOD5	(1) for fluid products plants receiving 250,000 lb./day or less of milk (less than 25,900 lb/day of BOD5

Case (1):

	Raw lbs/u*	Raw mg/l	BPT lbs/u*	BPT mg/l	BPT % rem	BAT lbs/u*	BAT mg/l	BAT % rem
BOD5	3.1	715	.225	50.0	92.7	.055	12	98.22
TSS	1.4	334	.338	75.0	75.9	.069	15	95.1
pH			Within the range of 6.0 - 9.0			Within the range of 6.0 - 9.0		

Raw Waste Load	BPT Regulations	BAT Regulations
	(2) For plants receiving more than 250,000 lb/day of milk equivalent:	(2) For plants receiving more than 250,000 lb/day of milk equivalent:

Case (2):

	Raw lbs/u*	Raw mg/l	BPT lbs/u*	BPT mg/l	BPT % rem	BAT lbs/u*	BAT mg/l	BAT % rem
BOD5	3.1	715	.135	30	95.7	.037	8	98.8
TSS	1.4	334	.203	45	86.0	.046	10	96.8
pH			Within the range of 6.0 - 9.0			Within the range of 6.0 - 9.0		

*100 lbs of BOD5 input

INDUSTRY: Dairy Products processing
SUBCATEGORY B: Fluid Products

V. MODEL PLANT ANALYSIS SUMMARY

	BPT			BAT			TOTAL		
Plant Flow (MGD)	Annual Cost Millions	Lbs BOD + TSS Removed Millions	$/Lb.	Incremental Annual Cost Millions	Incremental Lbs BOD + TSS Removed Millions	Incremental $/Lb.	Total Annual Cost Millions	Total Lbs BOD + TSS Removed Millions	Total $/Lb.
Small 0.07	0.043	0.155	0.28	0.002	0.017	.12	0.045	0.172	0.26
large 0.28	0.115	0.654	0.18	0.03	0.04	.76	0.145	0.694	0.21

INDUSTRY: Dairy Products Processing

SUBPART C: Cultured Products

I. Effluent Guidelines

Raw Waste Load			BPT Regulations 40 CFR 405.32 (b) Promulgated: May 28, 1974 Amended:				BAT Regulations 40 CFR 405.33 (b) Promulgated May 28, 1974 Amended:			
			(a) For cultured products plants receiving more than 60,000 lb/day of milk equivalent (More than 6,200 lb/day of BOD5 input)				(a) For cultured products plants receiving more than 60,000 lb/day of milk equivalent (More than 6,200 lb/day of BOD5 input)			
	lbs/u*	mg/l		lbs/u*	mg/l	% rem		lbs/u*	mg/l	% rem
BOD5	2.2	485	BOD5	.135	30	93.9	BOD5	.037	8	98.3
TSS	.67	150	TSS	.203	45	69.7	TSS	.046	10	93.1
			pH	Within the range of 6.0 - 9.0			pH	Within the range of 6.0 - 9.0		
			(b) For cultured products receiving 60,000 lb/day or less of milk equivalent (less than 6,200 lb/day of BOD5 input)				(b) For cultured products receiving 60,000 lb/day or less of milk equivalent (less than 6,200 lb/day of BOD5 input)			
	lbs/u*	mg/l		lbs/u*	mg/l	% rem		lbs/u*	mg/l	% rem
BOD5	2.2	485	BOD5	.225	50	89.8	BOD5	.055	12	97.5
TSS	.67	150	TSS	.338	75	49.6	TSS	.069	15	89.7
			pH	Within the range of 6.0 - 9.0			pH	Within the range of 6.0 - 9.0		

* 100 lbs of BOD5 input

INDUSTRY: Dairy Products
SUBCATEGORY C: Cultured Products

2. MODEL PLANT ANALYSIS SUMMARY

Plant Flow (MGD)	BPT Annual Cost Millions	BPT Lbs BOD + TSS Removed Millions	BPT $/Lb.	BAT Incremental Annual Cost Millions	BAT Incremental Lbs BOD + TSS Removed Millions	BAT Incremental $/Lb.	TOTAL Total Annual Cost Millions	TOTAL Total Lbs BOD + TSS Removed Millions	TOTAL Total $/Lb.
Small .02	0.037	0.021	1.71	0.001	0.004	0.29	0.038	0.025	1.48
Large .07	0.088	0.094	0.94	0.009	0.01	0.99	0.097	0.103	0.94

INDUSTRY: Dairy Products

SUBPART D: Butter

I. Effluent Guidelines

Raw Waste Load			BPT Regulations 40 CFR 405.42 Promulgated: May 28, 1974 Amended:				BAT Regulations 40 CFR 405.43 Promulgated May 28, 1974 Amended:			
Med & Large			(a) For plants processing more than 175,000 lb/day ME (18,180 lb/day of BOD5 input)				(a) For plants processing more than 175,000 lb/day ME (18,180 lb/day of BOD5 input)			
	lb/u*	mg/l		lb/u*	mg/l	% rem		lb/u*	mg/l	%rem
BOD5	7.7	850	BOD5	.055	57	99.3	BOD5	.008	8	99.9
TSS	3.8	420	TSS	.083	85	97.8	TSS	.010	10	99.7
			pH	Within the range of 6.0 - 9.0			pH	Within the range of 6.0 - 9.0		
Small			(b) For plants processing 175,000 lb/day ME or less (Less than 18,180 lb/day BOD5 input)				(b) For plants processing 175,000 lb/day ME or less (Less than 18,180 lb/day BOD5 input			
BOD5	7.7	850	BOD5	.091	95	98.8	BOD5	.013	13	99.8
TSS	3.8	420	TSS	.137	142	96.4	TSS	.016	16	99.6
			pH	Within the range of 6.0 - 9.0			pH	Within the range of 6.0 - 9.0		

* 100 lbs of BOD5 input

INDUSTRY: Dairy Products
SUBCATEGORY D: Butter

2. MODEL PLANT ANALYSIS SUMMARY

	BPT			BAT			TOTAL		
Plant Flow (MGD)	Annual Cost Millions	Lbs BOD + TSS Removed Millions	$/Lb.	Incremental Annual Cost Millions	Incremental Lbs BOD + TSS Removed Millions	Incremental $/Lb.	Total Annual Cost Millions	Total Lbs BOD + TSS Removed Millions	Total $/Lb.
Small .01	0.033	0.265	0.12	0.001	0.005	0.26	0.034	0.269	0.13
Large .04	0.04	1.037	0.04	0.006	0.011	0.59	0.046	1.048	0.04

INDUSTRY: Dairy Products Processing

SUBPART E: Cottage Cheese and Cultured Cream Cheese

I. Effluent Guidelines

Raw Waste Load			BPT Regulations 40 CFR 405.52 Promulgated: May 28, 1974 Amended:				BAT Regulations 40 CFR 405.53 Promulgated May 28, 1974 Amended:			
			(a) For plants processing more than 25,000 lb/day of milk equivalent (More than 2,600 lb/day of BOD5 input)				(a) For plants processing more than 25,000 lb/day of milk equivalent (More than 2,600 lb/day of BOD5 input)			
	lbs/u*	mg/l		lbs/u*	mg/l	%rem		lbs/u*	mg/l	% rem
BOD5	22.2	2500	BOD5	.268	30	98.8	BOD5	.074	8	99.7
TSS	1.3	150	TSS	.402	45	69.1	TSS	.093	10	92.8
			pH	Within the range of 6.0 - 9.0			pH	Within the range of 6.0 - 9.0		
			(b) For plants processing 25,000 lbs/day or less of milk equivalent (more than 2,600 lb/day of BOD5 input)				(b) For plants processing 25,000 lbs/day or less of milk equivalent (More than 2,600 lb/day of BOD5 input)			
BOD5	22.2	2500	BOD5	.446	50	98.0	BOD5	.111	13	99.5
	1.3	150	TSS	.669	75	48.5	TSS	.139	16	89.3
			pH	Within the range of 6.0 - 9.0			pH	Within the range of 6.0 - 9.0		

*100 lbs of BOD5 input

INDUSTRY: Dairy Products
SUBCATEGORY E:Cultured Cheese and Cultured Cream Cheese

2. MODEL PLANT ANALYSIS SUMMARY

Plant Flow (MGD)	BPT Annual Cost Millions	BPT Lbs BOD + TSS Removed Millions	BPT $/Lb.	BAT Incremental Annual Cost Millions	BAT Incremental Lbs BOD + TSS Removed Millions	BAT Incremental $/Lb.	TOTAL Total Annual Cost Millions	TOTAL Total Lbs BOD + TSS Removed Millions	TOTAL Total $/Lb.
Small .01	0.036	0.088	0.41	0.001	0.003	0.35	0.037	0.091	0.40
Large .06	0.044	0.357	0.12	0.008	0.008	1.06	0.052	0.365	0.14

INDUSTRY: Dairy

SUBPART F: Natural & Processed Cheese

I. Effluent Guidelines

Raw Waste Load			BPT Regulations 40 CFR 405.62 Promulgated: May 28, 1974 Amended: Sept. 13, 1974				BAT Regulations 40 CFR 405.63 Promulgated: May 28, 1974 Amended:			
			(a) For plants processing more than 10,390 lb/day of BOD5 input				(a) For plants processing more than 10,390 lb/day of BOD5 input			
	lbs/u*	mg/l		lbs/u*	mg/l	% rem		lbs/u*	mg/l	% rem
BOD5	5.8	625	BOD5	.029	30	99.5	BOD5	.008	8	99.9
TSS	1.8	200	TSS	.044	45	97.6	TSS	.010	10	99.4
			pH	Within the range of 6.0 - 9.0			pH	Within the range of 6.0 - 9.0		
			(b) For plants processing less than 10,390 lb/day of BOD5 input				(b) For plants processing less than 10,390 lb/day of BOD5 input			
	lbs/u*	mg/l		lbs/u*	mg/l	% rem		lbs/u*	mg/l	% rem
BOD5	5.8	625	BOD5	0.049	50	99.2	BOD5	0.013	13	99.8
TSS	1.8	200	TSS	0.073	75	95.9	TSS	0.016	16	99.1
			pH	Within the range of 6.0 - 9.0			pH	Within the range of 6.0 - 9.0		

* 100 lbs of BOD5 input

INDUSTRY: Dairy Products Processing
SUBCATEGORY F: Natural and Processed Cheese

V. MODEL PLANT ANALYSIS SUMMARY

	BPT			BAT			TOTAL		
Plant Flow (MGD)	Annual Cost Millions	Lbs BOD + TSS Removed Millions	$/Lb.	Incremental Annual Cost Millions	Incremental Lbs BOD + TSS Removed Millions	Incremental $/Lb.	Total Annual Cost Millions	Total Lbs BOD + TSS Removed Millions	Total $/Lb.
Small .01	0.031	0.142	0.22	0.001	0.002	0.61	0.032	0.144	0.22
Large .02	0.041	0.571	0.07	0.005	0.004	1.21	0.046	0.575	0.08

INDUSTRY: Dairy Products

SUBPART G: Fluid Mix for Ice Cream

I. Effluent Guidelines

Raw Waste Load			BPT Regulations 40 CFR 405.72 Promulgated: May 28, 1974 Amended: Sept. 13, 1974				BAT Regulations 40 CFR 405.73 Promulgated: May 28, 1974 Amended:			
			(a) For plants with a dairy products input of more than 85,000 lb/day of milk equivalent (more than 8,830 lb/day of BOD5 input)				(a) For plants with a dairy products input of more than 85,000 lb/day of milk equivalent (more than 8,830 lb/day of BOD5 input)			
	lbs/u*	mg/l		lbs/u*	mg/l	% rem		lbs/u*	mg/l	% rem
BOD5	9.5	410	BOD5	.088	37	99.1	BOD5	.024	10	99.7
TSS	2.9	125	TSS	.132	55	95.4	TSS	.030	12	99.0
			pH	Within the range of 6.0 - 9.0			pH	Within the range of 6.0 - 9.0		
			(b) For plants with a dairy products input of 85,000 lb/day or less of milk equivalent (less than 8,830 lb/day of BOD5 input				(b) For plant with a dairy products input of 85,000 lb/day or less of milk equivalent (less than 8,830 lb/day of BOD5 input			
				lbs/u*	mg/l	% rem		lbs/u*	mg/l	% rem
BOD5	9.5	410	BOD5	.146	60	98.5	BOD5	.036	15	99.6
TSS	2.9	125	TSS	.219	90	92.4	TSS	.045	19	98.4
			pH	Within the range of 6.0 - 9.0			pH	Within the range of 6.0 - 9.0		

*100 lbs of BOD5 input

INDUSTRY: Dairy Products
SUBCATEGORY G: Fluid Mix for Ice Cream

2. MODEL PLANT ANALYSIS SUMMARY

	BPT			BAT			TOTAL		
Plant Flow (MGD)	Annual Cost Millions	Lbs BOD + TSS Removed Millions	$/Lb.	Incremental Annual Cost Millions	Incremental Lbs BOD + TSS Removed Millions	Incremental $/Lb.	Total Annual Cost Millions	Total Lbs BOD + TSS Removed Millions	Total $/Lb.
Small .01	0.033	0.131	0.25	0.001	0.003	0.38	0.034	0.135	0.25
Large .05	0.040	0.539	0.08	0.007	0.007	0.98	0.047	0.546	0.09

INDUSTRY: Dairy

SUBPART H: Ice Cream, Frozen Desserts, etc.

I. Effluent Guidelines

Raw Waste Load			BPT Regulations 40 CFR 405.82 Promulgated: May 28, 1974 Amended:				BAT Regulations 40 CFR 405.83 Promulgated: May 28, 1974 Amended:			
			(a) For plants with a dairy products input of more than 85,000 lb/day of milk equilvant (more than 8,830 lb/day of BOD5 input)				(a) For plants with a dairy products input of more than 85,000 lb/day of milk milk equilvant (more than 8,830 lb/day of BOD5 input)			
	lbs/u*	mg/l		lbs/u*	mg/l	% rem		lbs/u*	mg/l	% rem
BOD5	129.4	2580	BOD5	.184	35	99.9	BOD5	.047	9	99.96
TSS	30.8	615	TSS	.276	53	99.1	TSS	.059	11	99.8
			pH	Within the range of 6.0 - 9.0			pH	With the range of 6.0 -9.0		
			(b) For plants with a dairy products input of 85,000 lb/day or less of milk equivalent (less than 8,830 lb/day of BOD5 input)				(b) For plants with a dairy products input of 85,000 lb/day or less of milk equivalent (less than 8,830 lb/day of BOD5 input)			
BOD5	129.4	2580	BOD5	.306	59	99.8	BOD5	.070	13	99.9
TSS	30.8	615	TSS	.459	88	98.5	TSS	.088	17	99.7
			pH	Within the range of 6.0 - 9.0			pH	Within the range of 6.0 - 9.0		

* 100 lbs of BOD5 input

INDUSTRY: Dairy Products
SUBCATEGORY H: Ice Cream, Frozen Desserts, etc.

2. MODEL PLANT ANALYSIS SUMMARY

	BPT			BAT			TOTAL		
Plant Flow (MGD)	Annual Cost Millions	Lbs BOD + TSS Removed Millions	$/Lb.	Incremental Annual Cost Millions	Incremental Lbs BOD + TSS Removed Millions	Incremental $/Lb.	Total Annual Cost Millions	Total Lbs BOD + TSS Removed Millions	Total $/Lb.
Small .03	0.037	1.740	0.02	0.002	0.007	0.31	0.039	1.747	0.02
Large .11	0.106	7.056	0.02	0.014	0.016	0.92	0.120	7.072	0.02

INDUSTRY: Dairy
SUBPART I: Condensed Milk

I. Effluent Guidelines

Raw Waste Load			BPT Regulations 40 CFR 405.92 Promulgated: May 12, 1974 Amended:				BAT Regulations 40 CFR 405.93 Promulgated May 28, 1974 Amended:			
			(a) For plants with a dairy products input of more than 100,000 lb/day of milk equivalent (more than 10,390 lb/day of BOD5 input)				(a) For plants with a dairy products input of more than 100,000 lb/day of milk equivalent (more than 10,390 lb/day of BOD5 input)			
	lbs/u*	mg/l		lbs/u*	mg/l	% rem		lbs/u*	mg/l	% rem
BOD5	21.2	480.	BOD5	.138	30	99.3	BOD5	.038	8	99.8
TSS	7.9	180	TSS	.207	45	97.4	GSS	.048	10	99.4
			pH	Within the range of 6.0 - 9.0			pH	Within the range of 6.0 - 9.0		
			(b) For plants with a dairy products input of 100,000 lb/day or less of milk equivalent (less than 10,390 lb/day of BOD5 input)				(b) For plants with a dairy products input of 100,000 lb/day or less of milk equivalent (less than 10,390 lb/day of BOD5 input)			
BOD5	21.2	480	BOD5	.230	50	98.9	BOD5	.058	13	99.7
TSS	7.9	180	TSS	.345	75	95.6	TSS	.072	16	99.1
			pH	Within the range of 6.0 - 9.0			pH	Within the range of 6.0 - 9.0		

(c) For plant in the size range covered by paragraph (b) once - through barometric condenser water may be discharged untreated if the composite net entrainment is below 15 mg/l of BOD5 for any one day and below 10 mg/l of BOD5 as the average for thirty consecutive days.

*100 lbs of BOD5 input

INDUSTRY: Dairy Products
SUBCATEGORY I: Condensed Milk

2. MODEL PLANT ANALYSIS SUMMARY

	BPT			BAT			TOTAL		
Plant Flow (MGD)	Annual Cost Millions	Lbs BOD + TSS Removed Millions	$/Lb.	Incremental Annual Cost Millions	Incremental Lbs BOD + TSS Removed Millions	Incremental $/Lb.	Total Annual Cost Millions	Total Lbs BOD + TSS Removed Millions	Total $/Lb.
Small .03	0.037	0.370	0.10	0.002	0.006	0.35	0.039	0.376	0.10
Large .11	0.093	1.492	0.06	0.015	0.013	1.09	0.108	1.506	0.07

INDUSTRY: Dairy Products

SUBPART J: Dry Milk

I. Effluent Guidelines

Raw Waste Load			BPT Regulations 40 CFR 405.102 Promulgated: May 28. 1974 Amended:				BAT Regulations 40 CFR 405.103 Promulgated: May 28, 1974 Amended:			
			(a) For milk drying plants with an input equivalent to more than 145,000 lb/day of milk equivalent (more than 15,070 lb/day of BOD5 input)				(a) For milk drying plants with an input equivalent to more than 145,000 lb/day of milk equivalent (more than 15,070 lb/day of BOD5 input)			
	lbs/u*	mg/l		lbs/u*	mg/l	% rem		lbs/u*	mg/l	% rem
BOD5	1.6	750	BOD5	.065	30	95.9	BOD5	.018	8	98.9
TSS	1.9	900	TSS	.098	45	94.8	TSS	.023	10	98.8
			pH	Within the range of 6.0 - 9.0			pH	Within the range of 6.0 - 9.0		
			(b) For milk drying plants with an input equivalent to 145,000 lb/day or less of milk equivalent (less than 15,070 lb/day of BOD5 input)				(b) For milk drying plants with an input equivalent to 145,000 lb/day or less of milk equivalent (less than 15,070 lb/day of BOD5 input)			
	lbs/u*	mg/l		lbs/u*	mg/l	% rem		lbs/u*	mg/l	% rem
BOD5	1.6	750	BOD5	.109	50	93.2	BOD5	.028	13	98.3
TSS	1.9	900	TSS	.164	75	91.4	TSS	.034	16	98.2
			pH	Within the range of 6.0 - 9.0			pH	Within the range of 6.0 - 9.0		

* 100 lbs of BOD5 input

INDUSTRY: Dairy Products
SUBCATEGORY J: Dry Milk

2. MODEL PLANT ANALYSIS SUMMARY

	BPT			BAT			TOTAL		
Plant Flow (MGD)	Annual Cost Millions	Lbs BOD + TSS Removed Millions	$/Lb.	Incremental Annual Cost Millions	Incremental Lbs BOD + TSS Removed Millions	Incremental $/Lb.	Total Annual Cost Millions	Total Lbs BOD + TSS Removed Millions	Total $/Lb.
Small .02	0.031	0.064	0.48	0.002	0.001	1.63	0.033	0.066	0.50
Large .08	0.089	0.257	0.35	0.01	0.009	1.05	0.099	0.266	0.37

INDUSTRY: Dairy Products Processing
SUBPART K: Condensed Whey

I. Effluent Guidelines

Raw Waste Load			BPT Regulations 40 CFR 405.112 Promulgated: May 28, 1974 Amended:				BAT Regulations 40 CFR 405.113 Promulgated May 28, 1974 Amended:			
			(a) For whey condensing plants with over 300,000 lb/day of fluid raw whey input (over 20,700 lb/day of solids or 14,160 lb/day of BOD5 input)				(a) For whey condensing plants with over 300,000 lb/day of fluid raw whey input (over 20,700 lb/day of solids or 14,160 lb.day of BOD5 input)			
	lbs/u*	mg/l		lbs/u*	mg/l	% rem		lbs/u*	mg/l	% rem
BOD5	.48	875	BOD5	.040	33	91.7	BOD5	.011	9	97.7
TSS	.39	715	TSS	.060	50	84.6	TSS	.014	11	96.4
			pH	Within the range of 6.0 - 9.0			pH	Within the range of 6.0 - 9.0		
			(b) For whey condensing plants with 300,000 lb/day or less of raw fluid whey input (less than 20,700 lb/day of solids or 14,160 lb/day of BOD5 input)				(b) For whey condensing plants with 300,000 lb/day or less of raw fluid whey input (less than 20,700 lb/day of solids or 14,160 lb/day of BOD5 input)			
BOD5	.48	875	BOD5	.065	54	86.5	BOD5	.016	14	96.7
TSS	.39	715	TSS	.098	81	74.9	TSS	.020	17	94.9
			pH	Within the range of 6.0 - 9.0			pH	Within the range of 6.0 - 9.0		

(c) For plants in the size range covered in paragraph (b) once-through borometric condenser water maybe discharged untreated if the composite net entrainment is below 15 mg/l of BOD5 for any one day and below 10 mg/l of BOD5 as the average for thirty consecutive days.

*100 lbs of BOD5 input

INDUSTRY: Dairy Products Processing
SUBCATEGORY K: Condensed Whey

V. MODEL PLANT ANALYSIS SUMMARY

Plant Flow (MGD)	BPT Annual Cost Millions	BPT Lbs BOD + TSS Removed Millions	BPT $/lb.	BAT Incremental Annual Cost Millions	BAT Incremental Lbs BOD + TSS Removed Millions	BAT Incremental $/Lbs.	TOTAL Total Annual Cost Millions	TOTAL Total Lbs BOD + TSS Removal Millions	TOTAL Total $/lb.
Small .01	0.035	0.037	0.95	0.002	0.003	0.76	0.037	0.04	0.94
Large .04	0.043	0.154	0.28	0.009	0.006	1.38	0.051	0.160	0.32

INDUSTRY: Dairy Products Processing

SUBPART: Dry Whey

I. Effluent Guidelines

Raw Waste Load			BPT Regulations 40 CFR 405.122 Promulgated: May 28, 1974 Amended:				BAT Regulations 40 CFR 405.123 Promulgated: May 28, 1974 Amended:			
			(a) For Whey drying plants with input equivalent to more than 57,000 lb/day of 40 percent solids whey (22,800 lb/day of solids or 15,670 lb/day of BOD5 input)				(a) For Whey drying plants with input equivalent to more than 57,000 lb/day of 40 percent solids whey (22,800 lb/day of solids or 15,670 lb/day of BOD5 input)			
	lbs/u*	mg/l		lbs/u*	mg/l	% rem		lbs/u*	mg/l	% rem
BOD5	3.8	1200	BOD5	.040	33	98.9	BOD5	.011	9	99.7
TSS	2.5	780	TSS	.060	50	97.6	TSS	.014	11	99.4
			pH	Within the range of 6.0 - 9.0			pH	Within the range of 6.0 - 9.0		
			(b) For whey drying plants with an input equivalent to 57,000 lb/day or less of 40 percent solids whey (under 22,800 lb/day solids or 15,620 lb/day of BOD5 input)				(b) For whey drying plants with an input equivalent to 57,000 lb/day or less of 40 percent solids whey (under 22,800 lb/day solids or 15,620 lb/day of BOD5 input)			
BOD5	3.8	1200	BOD5	.065	54	98.3	BOD5	.016	14	99.6
TSS	2.5	780	TSS	.098	81	96.1	TSS	.020	17	99.2
			pH	Within the range of 6.0 - 9.0			pH	Within the range of 6.0 - 9.0		

*100 lbs of BOD5 input

INDUSTRY: Dairy Products
SUBCATEGORY L: Dry Whey

V. MODEL PLANT ANALYSIS SUMMARY

	BPT			BAT			TOTAL		
Plant Flow (MGD)	Annual Cost Millions	Lbs BOD + TSS Removed Millions	$/Lb.	Incremental Annual Cost Millions	Incremental Lbs BOD + TSS Removed Millions	Incremental $/Lb.	Total Annual Cost Millions	Total Lbs BOD + TSS Removed Millions	Total $/Lb.
Small .01	0.033	0.043	0.77	0.001	0.002	0.39	0.034	0.046	0.74
Large .05	0.040	0.178	0.23	0.005	0.006	0.80	0.045	0.184	0.25

INDUSTRY: Grain Milling

SUBPART A: Corn Wet Milling

I. Effluent Guidelines

Raw Waste Load	BPT Regulations 40 CFR 406.12 Promulgated: March 20, 1974 Amended: Dec. 12, 1977	BAT Regulations 40 CFR 406.13 Promulgated March 20, 1974 Amended: Dec. 12, 1977

Raw Waste Load

	lb/u*	mg/l
BOD5	400	960
TSS	200	480

BPT Regulations

(b)	lb/u*	mg/l	% rem
BOD5	50	120	88
TSS	60	144	70
pH	Within the range of 6.0 - 9.0		

BAT Regulations

(b)	lbs/u*	mg/l	% rem
BOD5	20	48	95
TSS	30	72	85
pH	Within the range of 6.0 - 9.0		

(c) The limitations given in paragraph (b) of this section for BOD5 and TSS are derived for a point source producing products standards to the corn wet milling industry. For those plants producing modified starches at a rate of at least 15 percent by dry-basis weight of total sweetener and starch products per month for 12 consecutive months, the following limitations should be used to derive an additive adjustment to the discharge allowed by paragraph (b) of this section:

	BPT	BAT
BOD5	15	8
TSS	30	12

* 1000 std bu of corn

INDUSTRY: Grain Milling
SUBCATEGORY A: Corn Wet Milling

2. MODEL PLANT ANALYSIS SUMMARY

	BPT			BAT			Total		
Plant Flow (MGD)	Annual Cost Millions	Lbs BOD + TSS Removed Millions	$/Lb.	Incremental Annual Cost Millions	Incremental Lbs BOD + TSS Removed (Millions)	Incremental $/Lb.	Total Annual Cost Millions	Total Lbs BOD TSS Removed Millions	Total $/Lb.
s-1.5	.88	4.41	.20	.07	.54	.13	.95	4.95	.19
m-3.0	1.30	8.82	.15	.11	1.08	.10	1.41	9.90	.14
l-4.5	1.87	13.23	.14	.15	1.62	.09	2.02	14.85	.14

s - small plant
m - medium plant
l - large plant

INDUSTRY: Grain Milling

SUBPART B: Corn Dry Milling

I. Effluent Guidelines

Raw Waste Load			BPT Regulations 40 CFR 406.22 Promulgated: March 20, 1974 Amended:				BAT REgulations 40 CFR 406.23 Promulgated March 20, 1974 Amended:		
	lb/u*	mg/l		lb/u*	mg/l	% rem		lb/u*	mg/l	%rem
BOD	63	1750	BOD5	4.0	111	93.7	BOD5	2.0	56	96.8
TSS	90	2500	TSS	3.5	97	96.1	TSS	1.0	28	98.9
			pH	Within the range of 6.0 - 9.0			pH	Within the range of 6.0 - 9.0		

*1000 standard bushels

INDUSTRY: Grain Milling
SUBCATEGORY B: Corn Dry Milling

2. MODEL PLANT ANALYSIS SUMMARY

	BPT			BAT			TOYAL		
Plant Flow (MGD)	Annual Cost millions	Lbs BOD + TSS Removed millions	$/Lb.	Incremental Annual Cost millions	Incremental Lbs BOD + TSS Removed (millions)	Incremental $/Lb.	Total Annual Cost (millions)	Total Lbs BOD TSS Removed (millions)	Total $/Lb.
s-.07	.10	.57	.17	.02	.02	.85	.11	.59	.19
1-.13	.13	1.13	.11	.02	.04	.56	.15	1.17	.12

s - small plant
l - large plant

INDUSTRY: Grain Milling

SUBPART C: Normal Wheat Flour

I. Effluent Guidelines

Raw Waste Load	BPT Regulations 40 CFR 406.32 Promulgated: Amended:	BAT Regulations 40 CFR 406.33 Promulgated Amended:
	There shall be no discharge of process waste water pollutants to navigable waters.	There shall be no discharge of process waste water pollutants to navigable waters.

INDUSTRY: Grain Milling

SUBPART D: Bulgur Wheat

I. Effluent Guidelines

Raw Waste Load			BPT Regulations 40 CFR 406.42 Promulgated: March 20, 1974 Amended:				BAT Regulations 40 CFR 406.43 Promulgated March 20, 1974 Amended:		
	lb/u*	mg/l		lb/u*	mg/l	% rem		lb/u*	mg/l	% rem
BOD5	6.25	400	BOD5	.50	32	92	BOD5	.30	20	95
TSS	5.62	360	TSS	.50	32	91	TSS	.20	14	96
			pH	Within the range of 6.0 - 9.0			pH	Within the range of 6.0 - 9.0		

* 100 standard bushels

INDUSTRY: Grain Milling
SUBCATEGORY D: Bulgur Wheat

2. MODEL PLANT ANALYSIS SUMMARY

	BPT			BAT			TOTAL		
Plant Flow MGD	Annual Cost Millions	Lbs BOD + TSS Removed Millions	$/Lb.	Incremental Annual Cost Millions	Incremental Lbs BOD + TSS Removed (Millions)	Incremental $/Lb.	Total Annual Cost Millions	Total Lbs BOD TSS Removed Millions	Total $/Lb.
.015	.016	.023	.70	.023	.001	22.00	.039	.024	1.63

INDUSTRY: Grain Milling

SUBPART E: Normal Rice

I. Effluent Guidelines

Raw Waste Load	BPT Regulations 40 CFR 406.52 Promulgated: March 20, 1974 Amended:	BAT Regulations 40 CFR 406.52 Promulgated March 20, 1974 Amended:
	There shall be no discharge of process waste water pollutants to navigable waters.	There shall be no discharge of process waste water pollutants to navigable waters.

INDUSTRY: Grain Milling

SUBPART F: Parboiled Rice

I. Effluent Guidelines

Raw Waste Load			BPT Regulations 40 CFR 406.62 Promulgated: March 20, 1974 Amended:				BAT Regulations 40 CFR 406.63 Promulgated March 20, 1974 Amended:			
	lb/u*	mg/l		lb/u*	mg/l	% rem		lb/u*	mg/l	% rem
BOD5	.188	1380	BOD5	.014	103	93	BOD5	.007	52	96
TSS	.0075	55	TSS	.008	55	0	TSS	.003	21	60
			pH	Within the range of 6.0 - 9.0			pH	Within the range of 6.0 - 9.0		

* hundred weight of rice

INDUSTRY: Grain Milling
SUBCATEGORY F: Parboiled Rice

2. MODEL PLANT ANALYSIS SUMMARY

	BPT			BAT			TOTAL		
Plant Flow MGD	Annual Cost millions	Lbs BOD + TSS Removed Millions	$/Lb.	Incremental Annual Cost Millions	Incremental Lbs BOD + TSS Removed (Millions)	Incremental $/Lb.	Total Annual Cost Millions	Total Lbs BOD TSS Removed Millions	Total $/Lb.
.13	.13	.35	.38	.024	.024	1.02	.16	.37	.42

INDUSTRY: Grain Milling

SUBPART G: Animal Feed

I. Effluent Guidelines

Raw Waste Load	BPT Regulations 40 CFR 406.72 Promulgated: March 20, 1974 Amended:	BAT Regulations 40 CFR 406.73 Promulgated March 20, 1974 Amended:
	There shall be no discharge of process waste water pollutants to navigable waters.	There shall be no discharge of process waste water pollutants to navigable waters.

INDUSTRY: Grain Milling

SUBPART H: Hot Cereal

I. Effluent Guidelines

Raw Waste Load	BPT Regulations 40 CFR 406.82 Promulgated: March 20, 1974 Amended:	BAT Regulations 40 CFR 406.83 Promulgated March 20, 1974 Amended: Dec 12, 1974
	There shall be no discharge of process waste water pollutants to navibable waters.	There shall be no discharge of process waste water pollutants to navibigable waters

INDUSTRY: Grain Milling

SUBPART I: Ready-to-Eat Cereal

I. Effluent Guidelines

Raw Waste Load			BPT Regulations 40 CFR 406.92 Promulgated: March 20, 1974 Amended:				BAT Regulations 40 CFR 406.92 Promulgated March 20., 1974 Amended:		
	lb.u*	mg/l		lb/u*	mg/l	% rem		lb/u*	mg/l	% rem
BOD5	6.6	1130	BOD5	.40	68	94	BOD5	.20	34	97
TSS	1.4	240	TSS	.40	69	71	TSS	.15	26	89
			pH	Within the range of 6.0 - 9.0			pH	Within the range of 6.0 - 9.0		

* 100 lb. of cereal product

INDUSTRY: Grain Milling
SUBCATEGORY I: Ready-to-Eat Cereal

2. MODEL PLANT ANALYSIS SUMMARY

	BPT				BAT		TOTAL		
Plant Flow (MGD)	Annual Cost Millions	Lbs BOD + TSS Removed Millions	$/Lb.	Incremental Annual Cost Millions	Incremental Lbs BOD + TSS Removed (Millions)	Incremental $/Lb.	Total Annual Cost Millions	Total Lbs BOD TSS Removed Millions	Total $/Lb.
s -.140	.18	.37	.47	.018	.023	.76	.19	.40	.49
m -.350	.28	.94	.30	.033	.059	.57	.31	.99	.31
1 -.840	.44	2.25	.20	.064	.140	.45	.50	2.4	.21

s - small plant
m - medium plant
1 - large plant

INDUSTRY: Grain Milling

SUBPART J: Wheat Starch & Gluten

I. Effluent Guidelines

Raw Waste Load			BPT Regulations 40 CFR 406.102 Promulgated: Mar. 20, 1974 Amended:				BAT Regulations 40 CFR 406.103 Promulgated Mar. 20, 1974 Amended:			
	lb/u*	mg/l		lb/u*	mg/l	% rem		lb/u*	mg/l	% rem
BOD5	90.7	9057	BOD5	2.0	200	97.8	BOD5	.50	50	99.4
TSS	75.2	7509	TSS	2.0	200	97.3	TSS	.40	40	99.5
			pH	Within the range of 6.0 - 9.0			pH	Within the range of 6.0 - 9.0		

* 100 lb. of raw material

INDUSTRY: Grain Milling
SUBCATEGORY J: Wheat Starch & Gluten

2. MODEL PLANT ANALYSIS SUMMARY

	BPT			BAT			TOTAL		
Plant Flow (MGD	Annual Cost Millions	Lbs BOD + TSS Removed Millions	$/Lb.	Incremental Annual Cost Millions	Incremental Lbs BOD + TSS Removed (Millions)	Incremental $/Lb.	Total Annual Cost Millions	Total Lbs BOD TSS Removed Millions	Total $/Lb.
.12	.35	4.21	.08	.016	.081	.20	.368	4.290	.09

INDUSTRY: Canned & Preserved Fruits & Vegtables

SUBPART A: Apple Juice

I. Effluent Guidelines

Raw Waste Load			BPT Regulations 40 CFR 407.12 Promulgated: March 21, 1974 Amended:				BAT Regulations 40 CFR 407.13 Promulgated March 21, 1974 Amended: November 5, 1976			
	lb/u*	mg/l		lb/u*	mg/l	% rem		lb/u*	mg/l	% rem
BOD5	2.05	712	BOD5	0.3	104	85.4	BOD5	.10	35	95.1
TSS	0.3	104	TSS	0.4	139	0	TSS	.10	35	66.7
			pH	Within the range of 6.0 - 9.0			pH	Within the range of 6.0 - 9.0		

*1000 lbs of raw material

INDUSTRY: Canned & Preserved Fruits & Vegetables
SUBCATEGORY A: Apple Juice

2. MODEL PLANT ANALYSIS SUMMARY

Plant Flow (MGD)	BPT Annual Cost Millions	BPT Lbs BOD + TSS Removed Millions	BPT $/Lb.	BAT Incremental Annual Cost Millions	BAT Incremental Lbs BOD + TSS Removed Millions	BAT Incremental $/Lb.	TOTAL Total Annual Cost Millions	TOTAL Total Lbs BOD + TSS Removed Millions	TOTAL Total $/Lb.
Small Plant 0.069	Low 0.004	0.017	0.26	0.006	0.005	1.14	0.01	0.022	0.47
	High 0.005	0.017	0.32	0.006	0.005	1.16	0.011	0.022	0.52
Large Plant 0.35	Low 0.02	0.085	0.23	0.016	0.025	0.62	0.035	0.11	0.32
	High 0.016	0.085	0.19	0.014	0.025	0.57	0.03	0.11	0.28

INDUSTRY: Canned & Preserved Fruites & Vegtables

SUBPART B: Apple Products

I. Effluent Guidelines

Raw Waste Load			BPT Regulations 40 CFR 407.22 Promulgated: March 21, 1974 Amended:				BAT Regulations 40 CFR 407.23 Promulgated March 21, 1974 Amended: November 5, 1976			
	lb/u*	mg/l		lb/u*	mg/l	% rem		lb/u*	mg/l	% rem
BOD5	6.4	1198.5	BOD5	.55	102.8	91.4	BOD5	.10	18.7	98.4
TSS	.8	149.7	TSS	.70	131.5	12.5	TSS	.10	18.7	87.5
			pH	Within the range of 6.0 - 9.0			pH	Within the range of 6.0 - 9.0		

* 1000 lbs of raw material

INDUSTRY: Fruits & Vegetables
SUBCATEGORY B: Apple Products-Slices & Sauce

2. MODEL PLANT ANALYSIS SUMMARY

	BPT			BAT			TOTAL		
Plant Flow (MGD)	Annual Cost Millions	Lbs BOD + TSS Removed Millions	$/Lb.	Incremental Annual Cost Millions	Incremental Lbs BOD + TSS Removed Millions	Incremental $/Lb.	Total Annual Cost Millins	Total Lbs BOD + TSS Removed Millions	Total $/Lb.
Small Plant 0.13	Low 0.016	0.06	0.28	0.039	0.01	3.74	0.056	0.07	0.80
	High 00.013	0.06	0.22	0.019	0.01	1.79	0.032	0.07	0.46
Large Plant 1.29	Low 0.048	0.59	0.08	0.037	0.11	0.35	0.084	0.7	0.12
	High 0.046	0.59	0.08	0.019	0.11	0.18	0.065	0.7	0.09

INDUSTRY: Canned & Preserved Fruits & Vegetables

SUBPART C: Citrus Products

I. Effluent Guidelines

Raw Waste Load			BPT Regulations 40 CFR 407.32 Promulgated: March 21, 1974 Amended:				BAT Regulations 40 CFR 407.33 Promulgated: March 21, 1974 Amended: November 5, 1976			
	lb/u*	mg/l		lb/u*	mg/l	% rem		lb/u*	mg/l	% rem
BOD5	3.2	316.12	BOD5	.40	39.8	87	BOD5	.07	6.9	98
TSS	1.3	128.5	TSS	.85	84.1	35	TSS	.10	9.8	92
			pH	Within the range of 6.0 - 9.0			pH	Within the range of 6.0 - 9.0		

*1000 lbs of raw material

INDUSTRY: Fruits and Vegetables
SUBCATEGORY C: Citrus Products - Frozen Orange Juice

2. MODEL PLANT ANALYSIS SUMMARY

	BPT			BAT			TOTAL		
Plant Flow (MGD)	Annual Cost Millions	Lbs BOD + TSS Removed Millions	$/Lb.	Incremental Annual Cost Millions	Incremental Lbs BOD + TSS Removed Millions	Incremental $/Lb.	Total Annual Cost Millions	Total Lbs BOD + TSS Removed Millions	Total $/Lb.
Small Plant 0.97	Low 0.069	0.56	0.12	0.073	0.187	0.39	0.142	0.75	0.19
	High 0.066	0.56	0.12	0.021	0.187	0.11	0.087	0.75	0.12
Large Plant 9.7	Low 0.21	3.37	0.06	0.236	1.87	0.13	0.45	5.24	0.09
	0.27	3.37	0.08	0.065	1.87	0.03	0.34	5.24	0.06

INDUSTRY: Fruits & Vegetables

SUBPART D: Frozen Potato Products

I. Effluent Guidelines

Raw Waste Load			BPT Regulations 40 CFR 407.42 Promulgated: March 24, 1974 Amended:				BAT Regulations 40 CFR 407.43 Promulgated: March 21, 1974 Amended: November 5, 1976			
	lbs/u*	mg/l		lbs/u*	mg/l	% rem		lbs/u*	mg/l	% rem
BOD5	22.9	2027	BOD5	1.40	124	93.9	BOD	.17	15	99.3
TSS	19.4	1717	TSS	1.40	124	92.8	TSS	.55	49	97.2
			pH	Within the range of 6.0 - 9.0			pH	Within the range of 6.0 - 9.0		

*1000 lbs of raw material

INDUSTRY: Fruits & Veg.
SUBCATEGORY D: Frozen Potato Product

V. MODEL PLANT ANALYSIS SUMMARY

	BPT			BAT			TOTAL		
Plant Flow (MGD)	Annual Cost Millions	Lbs BOD + TSS Removed Millions	$/Lb.	Incremental Annual Cost Millions	Incremental Lbs BOD + TSS Removed Millions	Incremental $/Lb.	Total Annual Cost Millions	Total Lbs BOD + TSS Removed Millions	Total $/Lb.
Small Plant 1.08	Low 0.14	7.6	0.02	0.06	0.4	0.15	0.2	8.0	0.03
	High 0.093	7.6	0.01	0.02	0.4	0.05	0.114	8.0	0.01
Large Plant 2.71	Low 0.26	18.9	0.01	0.12	1.0	0.12	0.38	20.0	0.02
	High 0.21	18.9	0.01	0.034	1.0	0.03	0.24	20.0	0.01

INDUSTRY: Fruits & Vegetables

SUBPART E: Dehydrated Potato Products

I. Effluent Guidelines

Raw Waste Load			BPT Regulations 40 CFR 407.52 Promulgated: March 21, 1974 Amended:				BAT Regulations 40 CFR 407.53 Promulgated: March 21, 1974 Amended: November 5, 1976			
	lbs/u*	mg/l		lbs/u*	mg/l	% rem		lbs/u*	mg/l	% rem
BOD5	11.05	1261	BOD5	1.20	142.6	89	BOD5	.17	20.2	98
TSS	8.6	891.7	TSS	1.40	160	84	TSS	.55	62.8	94
			pH	Within the range of 6.0 - 9.0			pH	Within the range of 6.0 9.0		

* 1000 lbs of raw material

INDUSTRY: Canned & Preserved Fruits & Vegetables
SUBCATEGORY E: Dehydrated Potato Products

V. MODEL PLANT ANALYSIS SUMMARY

	BPT			BAT			TOTAL		
Plant Flow (MGD)	Annual Cost Millions	Lbs BOD + TSS Removed Millions	$/Lb.	Incremental Annual Cost Millions	Incremental Lbs BOD + TSS Removed Millions	Incremental $/Lb.	Total Annual Cost Millions	Total Lbs BOD + TSS Removed Millions	Total $/Lb.
Small Plant 0.42	Low 0.069	1.5	0.05	0.036	0.18	0.20	0.104	1.7	0.06
	High 0.045	1.5	0.03	0.014	0.18	0.08	0.059	1.7	0.03
Large Plant 1.26	Low 0.16	4.6	0.03	0.068	0.54	0.13	0.225	5.1	0.04
	High 0.11	4.6	0.02	0.023	0.54	0.04	0.133	5.1	0.03

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(a) The following limitations establish the quantity of BOD5 controlled by this section, which may be discharged by a "medium" or "large" existing point source subject to the provisions of this subpart after application of the best practicable control technology currently available. Any fruit processing plant which continuously or intermittently discharges process waste water during the processing season shall meet the annual average, maximum thirty day average, and maximum day BOD5 limitations. Fruit processing plants employing long term waste stabilization, where all or a portion of the process waste water discharge is stored for the entire processing season and released at a controlled rate with state approval, shall meet only the annual average BOD5 limitations.

[Metric units, kg/kkg of raw material; English units, lb/1,000 lb of raw material]

Commodity (fruits)	BOD5 effluent limitations: Maximum for any 1 day	Average of daily values for 30 consecutive days shall not exceed—	Annual average shall not exceed—
Apricots	2.00	1.32	1.28
Caneberries	0.77	0.46	0.32
Cherries:			
Brined	2.87	1.78	1.28
Sour	1.77	1.11	0.81
Sweet	1.12	0.69	0.49
Cranberries	1.71	1.02	0.73
Dried fruit	1.86	1.13	0.80
Grape juice:			
Canning	1.10	0.69	0.51
Pressing	0.22	0.14	0.10
Olives	5.44	3.34	2.39
Peaches	1.51	0.93	0.67
Pears	1.77	1.12	0.83
Pickles:			
Fresh pack	1.22	0.75	0.53
Process pack	1.45	0.92	0.68
Salt stations	0.18	0.12	0.09
Pineapples	2.13	1.33	0.96
Plums	0.69	0.42	0.29
Raisins	0.43	0.28	0.21
Strawberries	1.79	1.06	0.74
Tomatoes	1.21	0.71	0.54

(b) The following limitations establish the quantity of TSS controlled by this section, which may be discharged by a "medium" or "large" existing point source subject to the provisions of this subpart after application of the best practicable control technology currently available. Any fruit processing plant which continuously or intermittently discharges process waste water during the processing season shall meet the annual average, maximum thirty day average, and maximum day TSS limitations. Fruit processing plants employing long term waste stabilization, where all or a portion of the process waste water discharge is stored for the entire processing season and released at a controlled rate with state approval, shall meet only the annual average TSS limitations.

[Metric units, kg/kkg of raw material; English units, lb/1,000 lb of raw material]

Commodity (fruits)	TSS effluent limitations: Maximum for any 1 day	Average of daily values for 30 consecutive days shall not exceed—	Annual average shall not exceed—
Apricots	5.36	3.74	2.33
Caneberries	1.28	0.95	0.58
Cherries:			
Brined	5.13	3.58	2.38
Sour	3.20	2.30	1.52
Sweet	2.01	1.43	0.92
Cranberries	3.06	2.14	1.34
Dried fruit	3.34	2.34	1.48
Grape juice:			
Canning	1.99	1.44	0.96
Pressing	0.40	0.29	0.18
Olives	9.79	6.32	4.44
Peaches	2.72	1.93	1.26
Pears	3.21	2.32	1.53
Pickles:			
Fresh pack	2.19	1.54	0.99
Process pack	2.63	1.91	1.23
Salt stations	0.33	0.25	0.18
Pineapples	3.85	2.70	1.81
Plums	1.24	0.87	0.54
Raisins	0.78	0.57	0.38
Strawberries	3.19	2.20	1.35
Tomatoes	2.15	1.43	0.90

(c) The following limitations establish the quality of pH controlled by this section, which may be discharged by a "medium" or "large" existing point source subject to the provisions of this subpart after application of the best practicable control technology currently available.

Effluent characteristic	*Effluent limitations*
pH	At all times within the range 6.0 to 9.5.

§ 407.63 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable.

(a) The following limitations establish the quantity of BOD5 controlled by this section, which may be discharged by an existing point source subject to the provisions of this subpart after application of the best available technology economically achievable. Any fruit processing plant which continuously or intermittently discharges process waste water during the processing season shall meet the annual average, maximum thirty day average, and maximum day BOD5 limitations. Fruit processing plants employing long term waste stabilization, where all or a portion of the process waste water discharge is stored for the entire processing season and released at a controlled rate with state approval, shall meet only the annual average BOD5 limitations.

[Metric units, kg/kkg of raw material; English units, lb/1,000 lb of raw material]

Commodity (fruits)	BOD5 effluent limitations: Maximum for any 1 day	Average of daily values for 30 consecutive days shall not exceed—	Annual average shall not exceed—
Apricots:			
Medium	1.281	0.938	0.485
Large	1.281	0.938	0.485
Caneberries:			
Medium	0.182	0.134	0.067
Large	0.182	0.124	0.067
Cherries:			
Brined:			
Medium	0.763	0.621	0.423
Large	0.763	0.621	0.423
Sour:			
Medium	1.102	0.839	0.472
Large	1.102	0.839	0.423
Sweet:			
Medium	0.448	0.337	0.181
Large	0.448	0.237	0.181
Cranberries:			
Medium	0.620	0.465	0.248
Large	0.620	0.465	0.248
Dried Fruit:			
Medium	0.733	0.556	0.308
Large	0.733	0.556	0.308
Grape juice:			
Canning:			
Medium	0.766	0.583	0.226
Large	0.766	0.583	0.226
Pressing:			
Medium	0.111	0.085	0.047
Large	0.111	0.085	0.047
Olives:			
Medium	2.285	1.606	0.796
Large	2.285	1.606	0.796
Peaches:			
Medium	0.766	0.583	0.324
Large	0.766	0.583	0.324
Pears:			
Medium	0.855	0.664	0.397
Large	0.855	0.664	0.397
Pickles:			
Fresh pack:			
Medium	0.639	0.461	0.212
Large	0.639	0.461	0.212
Process pack:			
Medium	0.652	0.511	0.312
Large	0.652	0.511	0.312
Salt station:			
Medium	0.084	0.072	0.054
Large	0.084	0.072	0.054
Pineapples:			
Medium	1.478	1.111	0.599
Large	1.478	1.111	0.599
Plums:			
Medium	0.283	0.204	0.095
Large	0.283	0.204	0.095
Raisins:			
Medium	0.204	0.158	0.105
Large	0.204	0.158	0.105
Strawberries:			
Medium	0.619	0.449	0.239
Large	0.619	0.449	0.239
Tomatoes:			
Medium	0.524	0.373	0.173
Large	0.524	0.373	0.173

(b) The following limitations establish the quantity of TSS controlled by this section, which may be discharged by an existing point source subject to the provisions of this subpart after application of the best available technology economically achievable. Any fruit processing plant which continuously or intermittently discharges process waste water during the processing season shall meet the annual average, maximum thirty day average, and maximum day TSS limitations. Fruit processing plants employing long term waste stabilization, where all or a portion of the process waste water discharge is stored for the entire processing season and released at a controlled rate with state approval, ... only th... TSS

[Metric units, kg/kkg of raw material; English units, lb/1,000 lb of raw material]

Commodity (fruits)	TSS effluent limitations: Maximum for any 1 day	Average of daily values for 30 consecutive days shall not exceed—	Annual average shall not exceed—
Apricots:			
Medium	2.278	1.209	0.986
Large	1.281	0.938	0.485
Caneberries:			
Medium	0.323	0.184	0.137
Large	0.182	0.124	0.067
Cherries:			
Brined:			
Medium	1.438	1.012	0.872
Large	0.763	0.621	0.423
Sour:			
Medium	2.013	1.225	0.962
Large	1.102	0.839	0.472
Sweet:			
Medium	0.813	0.479	0.268
Large	0.448	0.337	0.181
Cranberries:			
Medium	1.124	0.660	0.505
Large	0.620	0.465	0.248
Dried fruit:			
Medium	1.337	1.300	0.627
Large	0.733	0.556	0.308
Grape juice:			
Canning:			
Medium	1.299	0.849	0.666
Large	0.766	0.583	0.226
Pressing:			
Medium	0.203	0.123	0.097
Large	0.111	0.085	0.047
Olives:			
Medium	2.926	2.191	1.812
Large	2.285	1.606	0.796
Peaches:			
Medium	1.297	0.844	0.680
Large	0.766	0.583	0.324
Pears:			
Medium	1.575	1.003	0.812
Large	0.855	0.664	0.397
Pickles:			
Fresh pack:			
Medium	1.129	0.606	0.429
Large	0.639	0.461	0.212
Process pack:			
Medium	1.236	0.784	0.643
Large	0.652	0.511	0.312
Salt station:			
Medium	0.163	0.125	0.113
Large	0.084	0.072	0.054
Pineapples:			
Medium	2.681	1.585	1.220
Large	1.478	1.111	0.599

[Metric units, kg/kkg of raw material; English units, lb/1,000 lb of raw material]

Commodity (fruits)	TSS effluent limitations: Maximum for any 1 day	Average of daily values for 30 consecutive days shall not exceed—	Annual average shall not exceed—
Plums:			
Medium	0.504	0.270	0.191
Large	0.283	0.204	0.095
Raisins:			
Medium	0.380	0.257	0.217
Large	0.204	0.158	0.105
Strawberries:			
Medium	1.105	0.594	0.422
Large	0.619	0.449	0.210
Tomatoes:			
Medium	0.932	0.495	0.349
Large	0.524	0.373	0.173

(c) The following limitations establish the quality of pH controlled by this section, which may be discharged by a "medium" or "large" existing point source subject to the provisions of this subpart after application of the best available technology economically achievable.

Effluent characteristic	*Effluent limitations*
	At all times within the

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(a) The following limitations establish the quantity of BOD5 controlled by this section, which may be discharged by a "medium" or "large" existing point source subject to the provisions of this subpart after application of the best practicable control technology currently available. Any vegetable processing plant which continuously or intermittently discharges process waste water during the processing season shall meet the annual average, maximum thirty day average, and maximum day BOD5 limitations. Vegetable processing plants employing long term waste stabilization, where all or a portion of the process waste water discharge is stored for the entire processing season and released at a controlled rate with state approval, shall meet only the annual average BOD5 limitations. The effluent limitations do not apply to single-commodity 100 percent canned corn processing plants of all sizes, and multi-commodity 100 percent frozen vegetable processing plants with total annual raw material production less than 7,264 kkg (8,000 tons) per year.

[Metric units, kg/kkg of raw material; English units, lb/1,000 lb of raw material]

Commodity (vegetables)	BOD5 effluent limitations		
	Maximum for any 1 day	Average of daily values for 30 consecutive days shall not exceed—	Annual average shall not exceed—
Beets	1.01	0.71	0.57
Broccoli	2.82	2.21	1.47
Carrots	1.76	1.11	0.82
Corn:			
Canned	0.71	0.48	0.38
Frozen	1.45	0.84	0.58
Dehydrated onion/garlic	2.45	1.46	0.98
Dehydrated vegetables	2.98	1.76	1.21
Dry beans	2.50	1.51	1.07
Lima beans	2.88	2.19	1.51
Mushrooms	2.01	1.78	1.22
Onions (canned)	2.09	1.52	1.25
Peas	2.42	1.50	1.08
Sauerkraut:			
Canning	0.30	0.30	0.22
Cutting	0.08	0.05	0.04
Snap beans	1.51	0.87	0.58
Spinach	2.37	1.36	0.71
Squash	0.90	0.59	0.46
Potatoes	0.98	0.56	0.65

(b) The following limitations establish the quantity of TSS controlled by the section, which may be discharged by a "medium" or "large" existing point source subject to the provisions of this subpart after application of the best practicable control technology currently available. Any vegetable processing plant which continuously or intermittently discharges process waste water during the processing season shall meet the annual average, maximum thirty day average, and maximum day TSS limitations. Vegetable processing plants employing long term waste stabilization, where all or a portion of the process waste water discharge is stored for the entire processing season and released at a controlled rate with state approval, shall meet only the annual average TSS limitations. The effluent limitations do not apply to single-commodity 100 percent canned corn processing plants of all sizes, and multi-commodity 100 percent frozen vegetable processing plants with total annual raw material production less than 7,264 kkg (8,000 tons) per year.

[Metric units, kg/kkg of raw material; English units, lb/1,000 lb of raw material]

Commodity (vegetables)	TSS effluent limitations		
	Maximum for any 1 day	Average of daily values for 30 consecutive days shall not exceed—	Annual average shall not exceed—
Beets	1.88	1.47	1.12
Broccoli	6.73	4.57	2.65
Carrots	3.19	2.30	1.54
Corn:			
Canned	1.32	1.00	0.73
Frozen	3.13	2.30	1.57
Dehydrated onion/garlic	4.49	3.02	1.78
Dehydrated vegetables	5.20	3.65	2.21
Dry beans	4.48	3.13	1.97
Lima beans	6.58	4.53	2.76
Mushrooms	5.56	3.68	2.22
Onions (canned)	5.51	3.78	2.28
Peas	4.38	3.11	2.02
Sauerkraut:			
Canning	0.89	0.63	0.40
Cutting	0.14	0.11	0.08
Snap beans	2.67	1.90	1.04
Spinach	4.19	2.81	1.64
Squash	1.54	1.23	0.87
Potatoes	1.68	1.37	1.09

(c) The following limitations establish the quality of pH controlled by this section, which may be discharged by a "medium" or "large" existing point source subject to the provisions of this subpart after application of the best practicable control technology currently available. The effluent limitations do not apply to single-commodity 100 percent canned corn processing plants of all sizes, and multi-commodity 100 percent frozen vegetable processing plants with total annual raw material production less than 7,264 kkg (8,000 tons) per year.

Effluent characteristic	*Effluent limitations*
pH	At all times within the range 6.0 to 9.5.

§ 407.73 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable.

(a) The following effluent limitations establish the quantity of BOD5 controlled by this section, which may be discharged by an existing point source subject to the provisions of this subpart after application of the best available technology economically achievable. Any

bilization, where all or a portion of the process waste water discharge is stored for the entire processing season and released at a controlled rate with state approval, shall meet only the annual average TSS limitations. The effluent limitations do not apply to single-commodity 100 percent canned corn processing plants of all sizes, and multi-commodity 100 percent frozen vegetable processing plants with total annual raw material production less than 7,264 kkg (8,000 tons) per year.

[Metric units, kg/kkg of raw material; English units, lb/1,000 lb of raw material]

Commodity (vegetables)	TSS effluent limitations		
	Maximum for any 1 day	Average of daily values for 30 consecutive days shall not exceed—	Annual average shall not exceed—
Beets:			
Medium	1.242	0.852	0.722
Large	0.682	0.548	0.361
Broccoli:			
Medium	2.342	1.671	1.114
Large	1.894	1.237	0.557
Carrots:			
Medium	1.756	1.046	0.809
Large	0.966	0.729	0.397
Corn:			
Canned:			
Medium	0.837	0.530	0.494
Large	0.446	0.360	0.240
Frozen:			
Medium	1.832	1.204	0.994
Large	0.987	0.778	0.485
Dehydrated onion/garlic:			
Medium	2.067	1.102	0.731
Large	1.159	0.837	0.387
Dehydrated vegetables:			
Medium	2.178	1.699	1.206
Large	1.781	1.288	0.598
Dry beans:			
Medium	2.509	1.262	0.931
Large	1.403	1.021	0.486
Lima beans:			
Medium	3.117	1.633	1.138
Large	1.753	1.258	0.566
Mushrooms:			
Medium	2.122	1.146	0.820
Large	1.188	0.862	0.406
Onions (canned):			
Medium	3.135	1.803	1.480
Large	1.719	1.306	0.726
Peas:			
Medium	1.818	1.108	0.871
Large	0.995	0.758	0.427
Sauerkraut:			
Canning:			
Medium	0.470	0.270	0.204
Large	0.260	0.194	0.100
Cutting:			
Medium	0.087	0.064	0.058
Large	0.046	0.038	0.027
Snap beans:			
Medium	1.858	0.955	0.853
Large	1.048	0.747	0.326
Spinach:			
Medium	2.075	1.038	0.611
Large	1.178	0.830	0.346
Squash:			
Medium	0.534	0.307	0.222
Large	0.295	0.220	0.114
Potatoes:			
Medium	1.090	0.803	0.707
Large	0.572	0.476	0.342

(c) The following limitations establish the quality of pH controlled by this section, which may be discharged by a "medium" or "large" existing point source subject to the provisions of this subpart after application of the best available control technology economically achievable. The effluent limitations do not apply to single-commodity 100 percent canned corn processing plants of all sizes, and multi-commodity 100 percent frozen vegetable processing plants with total annual raw material production less than 7,264 kkg (8,000 tons) per year.

tinuously or intermittently — — process waste water during the processing season shall meet the annual average, maximum thirty day average, and maximum day BOD5 limitations. Vegetable processing plants employing long term waste stabilization, where all or a portion of the process waste water discharge is stored for the entire processing season and released at a controlled rate with state approval, shall meet only the annual average BOD5 limitations. The effluent limitations do not apply to single-commodity 100 percent canned corn processing plants of all sizes, and multi-commodity 100 percent frozen vegetable processing plants with total annual raw material production less than 7,264 kkg (8,000 tons) per year.

[Metric units, kg/kkg of raw material; English units, lb/1,000 lb of raw material]

Commodity (vegetables)	BOD5 effluent limitations		
	Maximum for any 1 day	Average of daily values for 30 consecutive days shall not exceed—	Annual average shall not exceed—
Beets:			
Medium	0.682	0.548	0.361
Large	1.682	0.548	0.361
Broccoli:			
Medium	1.894	1.337	0.557
Large	1.394	1.337	0.557
Carrots:			
Medium	0.966	0.729	0.397
Large	0.966	0.729	0.397
Corn:			
Canned:			
Medium	0.446	0.360	0.240
Large	0.446	0.360	0.240
Frozen:			
Medium	0.987	0.778	0.485
Large	0.987	0.778	0.485
Dehydrated onion/garlic:			
Medium	1.159	0.837	0.387
Large	1.159	0.837	0.387
Dehydrated vegetables:			
Medium	1.781	1.288	0.598
Large	1.781	1.288	0.598
Dry beans:			
Medium	1.403	1.021	0.486
Large	1.403	1.021	0.486
Lima beans:			
Medium	1.753	1.258	0.566
Large	1.753	1.258	0.566
Mushrooms:			
Medium	1.188	0.862	0.406
Large	1.188	0.862	0.406
Onions (canned):			
Medium	1.719	1.306	0.726
Large	1.719	1.306	0.726
Peas:			
Medium	0.995	0.758	0.427
Large	0.995	0.758	0.427
Sauerkraut:			
Canning:			
Medium	0.260	0.194	0.100
Large	0.260	0.194	0.100
Cutting:			
Medium	0.046	0.038	0.027
Large	0.046	0.038	0.027
Snap beans:			
Medium	1.048	0.747	0.326
Large	1.048	0.747	0.326
Spinach:			
Medium	1.178	0.830	0.346
Large	1.178	0.830	0.346
Squash:			
Medium	0.295	0.220	0.114
Large	0.295	0.220	0.114
Potatoes:			
Medium	0.572	0.475	0.342
Large	0.572	0.475	0.342

(b) The following limitations establish the quantity of TSS controlled by this section, which may be discharged by any existing point source subject to the provisions of this subpart after application of the best available technology economically achievable. Any vegetable processing plant which continuously or intermittently discharges process waste water during the processing season shall

INDUSTRY: Canned & Preserved Fruits and Vegetables
SUBCATEGORIES: F & G Canned and Preserved Fruits
Canned and Preserved Vegetables

V. MODEL PLANT ANALYSIS SUMMARY

	BPT			BAT			TOTAL		
Plant Flow (MGD)	Annual Cost Millions	Lbs BOD + TSS Removed Millions	$/Lb.	Incremental Annual Cost Millions	Incremental Lbs BOD + TSS Removed Millions	Incremental $/Lb.	Total Annual Cost Millions	Total Lbs BOD + TSS Removed Millions	Total $/Lb.
Mushrooms									
s - .037	.086	.050	1.70	.018	.011	1.59	.104	.061	1.69
l - .074	.096	.101	0.95	.024	.022	1.08	.120	.123	0.98
Sauerkraut									
s - .014	.075	.042	1.77	.023	.004	6.18	0.097	.046	2.11
l - .022	.075	.067	1.12	.026	.006	4.38	0.100	.072	1.39
Tomatoes									
s - .147	.088	0.42	0.21	.068	0.078	0.91	0.157	.498	0.32
l - .882	.249	2.52	0.10	.179	0.448	0.40	0.428	2.968	0.14
Corn, Peas									
xs -.024	.076	.136	0.56	.015	.007	2.32	.091	.130	0.70
s - .095	.114	.533	0.21	.049	.034	1.44	.163	.567	0.29
m - .294	.200	1.643	0.12	.086	.106	1.15	.286	1.749	0.16
l - .952	.460	5.328	0.09	.174	.344	0.51	.635	5.672	0.11
Corn, Peas Green beans carrotts (canned)									
s - .084	.119	.385	0.30	.026	.027	0.98	.145	.412	0.35
m - .212	.176	.963	0.18	.081	.068	1.19	.257	1.031	0.25
l - .424	.271	1.925	0.14	.121	.135	0.90	.392	2.060	0.19

INDUSTRY: Canned & Preserved Fruits and Vegetables
SUBCATEGORIES: F & G Canned and Preserved Fruits
Canned and Preserved Vegetables

V. MODEL PLANT ANALYSIS SUMMARY

	BPT			BAT			TOTAL		
Plant Flow (MGD)	Annual Cost Millions	Lbs. BOD + TSS Removed Millions	$/Lb.	Incremental Annual Cost Millions	Incremental Lbs BOD + TSS Removed Millions	Incremental $/Lb.	Total Annual Cost Million	Total Lbs BOD + TSS Removed Millions	Total $/Lb.
corn, peas, grean beans carrots (frozen)									
xs - .092	.126	.401	0.31	.028	.030	0.94	.154	.431	0.36
s - .165	.179	.723	0.24	.088	.053	1.65	.267	.776	0.34
m - .229	.221	1.004	0.22	.107	.074	1.44	.328	1.078	0.30
1 - .459	.346	2.007	0.17	.164	.148	1.10	.510	2.155	0.24
Brocolli, Spinach, Lima Beans, Cauliflower									
s - .252	0.119	.159	0.74	0.029	0.015	1.93	.148	0.174	0.85
m - .787	0.228	.496	0.46	0.153	0.134	1.14	.381	0.630	0.61
1 - 1.259	0.311	.794	0.39	0.193	0.214	0.90	.504	1.008	0.50
Tomato, Dry Bean									
xs - 0.62	.106	.176	0.60	.015	.020	0.75	.121	.196	0.62
s - .177	.145	.503	0.28	.086	.071	1.21	.231	.574	0.40
m - .619	.308	1.759	0.17	.173	.248	0.69	.482	2.007	0.24
1 - 1.106	.450	3.141	0.14	.244	.443	0.52	.694	3.584	0.19

INDUSTRY: Canned & Preserved Fruits and Vegetables
SUBCATEGORIES: F & G Canned and Preserved Fruits
Canned and Preserved Vegetables

V. MODEL PLANT ANALYSIS SUMMARY

	BPT			BAT			TOTAL		
Plant Flow (MGD)	Annual Cost Millions	Lbs BOD + TSS Removed Millions	$/Lb.	Incremental Annual Cost Millions	Incremental Lbs BOD + TSS Removed Millions	Incremental S/Lb	Total Annual Cost Million	Total Lbs BOD + TSS Removed Millions	Total $/Lb.
:herry, jreen beans ›lum									
s - .021	.080	.095	0.84	.018	.008	2.21	.098	.103	0.95
m - .066	.107	.190	0.56	.019	.021	0.90	.126	.211	0.60
1 - .120	.154	.378	0.40	.087	.042	2.07	.196	.420	0.47
:herry, :anebury strawberry									
s - .012	.075	.022	3.34	.025	.004	6.30	.010	.026	0.39
1 - .029	.090	.056	1.60	.013	.010	1.40	.103	.066	1.56

407.82

(a) The following limitations establish the quantity of BOD5 controlled by this section, which may be discharged by a "medium" or "large" existing point source subject to the provisions of this subpart after application of the best practicable control technology currently available. Any food specialty plant which continuously or intermittently discharges process waste water during the processing season shall meet the annual average, maximum thirty day average, and maximum day BOD5 limitations. Food specialty plants employing long term waste stabilization, where all or a portion of the process waste water discharge is stored for the entire processing season and release at a controlled rate with state approval, shall meet only the annual average BOD5 limitations. Effluent limitations for the soups subcategory are based upon pounds (lb) or kilograms (kg) of pollutant per 1000 pounds (lb) or kilograms (kkg) of raw ingredients.

[Metric units, kg/kkg of final product; English units, lb/1,000 lb of final product]

Commodity (specialties)	BOD5 effluent limitations: Maximum for any 1 day	Average of daily values for 30 consecutive days shall not exceed—	Annual average shall not exceed—
Added ingredients	0.95	0.55	0.36
Baby food	1.23	0.73	0.51
Chips:			
Corn	1.58	1.04	0.80
Potato	3.46	2.17	1.58
Tortilla	2.41	1.50	1.09
Ethnic foods	2.30	1.41	0.96
Jams/jellies	0.42	0.26	0.19
Mayonnaise and dressings	0.37	0.24	0.17
Soups	4.14	2.46	1.69
Tomato-starch-cheese canned specialties	1.87	1.08	0.72

(b) The following limitations establish the quantity of TSS controlled by this section, which may be discharged by a "medium" or "large" existing point source subject to the provisions of this subpart after application of the best practicable control technology currently available. Any food specialty plant which continuously or intermittently discharges process waste water during the processing season shall meet the annual average, maximum thirty day average, and maximum day TSS limitations. Food specialty plants employing long term waste stabilization, where all or a portion of the process waste water discharge is stored for the entire processing season and released at a controlled rate with state approval, shall meet only the annual average TSS limitations. Effluent limitations for the soups subcategory are based upon pounds (lb) or kilograms (kg) of pollutant per 1000 pounds (lb) or kilograms (kkg) of raw ingredients.

[Metric units, kg/kkg of final product; English units, lb/1,000 lb of final product]

Commodity (specialties)	TSS effluent limitations: Maximum for any 1 day	Average of daily values for 30 consecutive days shall not exceed—	Annual average shall not exceed—
Added ingredients	0.00	0.00	0.00
Baby food	2.28	1.35	0.96
Chips:			
Corn	2.90	2.17	1.53
Potato	6.25	4.49	2.97
Tortilla	4.24	3.11	2.04
Ethnic foods	4.23	2.91	1.73
Jams/jellies	0.78	0.54	0.36
Mayonnaise and dressings	0.67	0.49	0.33
Soups	7.38	5.09	3.10
Tomato-starch-cheese canned specialties	3.31	2.23	1.30

(c) The following limitations establish the quality of pH controlled by this section, which may be discharged by a "medium" or "large" existing point source subject to the provisions of this subpart after application of the best practicable control technology currently available.

Effluent characteristic	*Effluent limitations*
Oil and grease	Shall not exceed 20mg/l.
pH	At all times within the range 6.0 to 9.5.

§ 407.83 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable.

(a) The following limitations establish the quantity of BOD5 controlled by this section, which may be discharged by an existing point source subject to the provisions of this subpart after application of the best available technology economically achievable. Any food specialty plant which continuously or intermittently discharges process waste water during the processing season shall meet the annual average, maximum thirty day average, and maximum day BOD5 limitations. Food specialty plants employing long term waste stabilization, where all or a portion of the process waste water discharge is stored for the entire processing season and released at

[Metric units, kg/kkg of final product; English units, lb/1,000 lb of final product]

Commodity (specialties)	BOD5 effluent limitations		
	Maximum for any 1 day	Average of daily values for 30 consecutive days shall not exceed—	Annual average shall not exceed—
Added ingredients:			
Medium	0.780	0.550	0.230
Large	0.780	0.550	0.220
Baby food:			
Medium	0.839	0.611	0.290
Large	0.839	0.611	0.290
Chips:			
Corn:			
Medium	1.142	0.898	0.557
Large	1.142	0.898	0.557
Potato:			
Medium	1.683	1.244	0.629
Large	1.683	1.244	0.629
Tortilla:			
Medium	1.665	1.253	0.676
Large	1.665	1.253	0.676
Ethnic foods:			
Medium	1.588	1.143	0.520
Large	1.588	1.143	0.520
Jams/jellies:			
Medium	0.187	0.142	0.080
Large	0.187	0.142	0.080
Mayonnaise and dressings:			
Medium	0.210	0.163	0.097
Large	0.210	0.163	0.097
Soups:			
Medium	2.766	2.000	0.929
Large	2.766	2.000	0.929
Tomato-starch-cheese canned specialties:			
Medium	0.981	0.705	0.319
Large	0.981	0.705	0.318

a controlled rate with state approval, shall meet only the annual average BOD5 limitations. Effluent limitations for the soups subcategory are based upon pounds (lb) or kilograms (kg) of pollutants per 1000 pounds (lb) of kilograms (kkg) of raw ingredients.

(b) The following limitations establish the quantity of TSS controlled by this section, which may be discharged by an existing point source subject to the provisions of this subpart after application of the best available technology economically achievable. Any food specialty plant which continuously or intermittently discharges process waste water during the processing season shall meet the annual average, maximum thirty day average, and maximum day TSS limitations. Food specialty plants employing long term waste stabilization, where all or a portion of the process waste water discharge is stored for the entire processing season and released at a controlled rate with state approval, shall meet only the annual average TSS limitations. Effluent limitations for the soups sub-

[Metric units, kg/kkg of final product; English units, lb/1,000 lb of final product]

Commodity (specialties)	TSS effluent limitations		
	Maximum for any 1 day	Average of daily values for 30 consecutive days shall not exceed—	Annual average shall not exceed—
Added ingredients:			
Medium	0.000	0.000	0.000
Large	0.000	0.000	0.000
Baby food:			
Medium	1.501	0.815	0.586
Large	0.839	0.611	0.290
Chips:			
Corn:			
Medium	2.117	1.386	1.143
Large	1.142	0.898	0.557
Potato:			
Medium	2.032	1.714	1.274
Large	1.683	1.244	0.629
Tortilla:			
Medium	2.025	1.789	1.377
Large	1.365	1.253	0.676
Ethnic foods:			
Medium	2.826	1.491	1.048
Large	1.588	1.143	0.520
Jams/jellies:			
Medium	0.342	0.208	0.164
Large	0.187	0.142	0.080
Mayonnaise and Dressings:			
Medium	0.286	0.245	0.198
Large	0.210	0.163	0.097
Soups:			
Medium	4.984	2.638	1.872
Large	2.766	2.000	0.929
Tomato-starch-cheese canned specialties:			
Medium	1.745	0.918	0.648
Large	0.981	0.705	0.319

category are based upon pounds (lb) or kilograms (kg) of pollutants per 1000 pounds (lb) or kilograms (kkg) of raw ingredients.

(c) The following limitations establish the quality of pH controlled by this section, which may be discharged by a "medium" or "large" existing point source subject to the provisions of this subpart.

Effluent characteristic	*Effluent limitations*
Oil and grease	Shall not exceed 10 mg/l.
pH	At all times within the range 6.0 to 9.5.

INDUSTRY: Canned and Preserved Fruits and Vegetables
SUBCATEGORY II: Canned and Miscellaneous Specialties

V. MODEL PLANT ANALYSIS SUMMARY

	BPT			BAT			TOTAL		
Plant Flow (MGD)	Annual Cost Millions	Lbs BOD + TSS Removed Millions	$/Lb.	Incremental Annual Cost Millions	Incremental Lbs BOD + TSS Removed Millions	Incremental $/Lb.	Total Annual Cost Millions	Total Lbs BOD + TSS Removed Millions	Total $/Lb.
Potato Chips									
xs - .039	.099	.261	0.38	.016	.006	2.67	.115	.267	0.43
s - .123	.101	1.226	0.08	.025	.019	1.32	.126	1.245	0.10
m - .200	.116	1.992	0.06	.058	.042	1.38	.174	2.034	0.09
l - .463	.145	4.596	0.03	.083	.097	0.86	.229	4.693	0.05

INDUSTRY: Canned and Preserved Seafoods

SUBPART A: Farm Raised Catfish

I. Effluent Guidelines

Raw Waste Load			BPT Regulations 40 CFR 408.12 Promulgated: June 26, 1974 Amended:				BAT Regulations 40 CFR 408.13 Promulgated: June 26, 1974 Amended:			
	lb/u*	mg/l		lbs/u*	mg/l	% rem		lbs/u*	mg/l	% rem
BOD5	NA	NA	BOD5	NA	NA	NA	BOD5	2.3	NA	NA
TSS	NA	NA	TSS	9.2	NA	NA	TSS	5.7	NA	NA
Oil & Grease	NA	NA	Oil & Grease	3.4	NA	NA	Oil & Grease	.45	NA	NA
			pH	Within the range of 6.0 - 9.0			pH	Within the Range of 6.0 - 9.0		

* 1000 lb of seafood

NA - Not Available

SUFFICIENT DATA NOT AVAILABLE TO CALCULATE COST AND REMOVALS

INDUSTRY: Canned & Preserved Seafoods

SUBPART B: Conventional Blue Crab

I. Effluent Guidelines

Raw Waste Load			BPT Regulations 40 CFR 408.22 Promulgated: June 26, 1974 Amended:				BAT Regulations 40 CFR 408.23 Promulgated June 26, 1974 Amended:			
	lbs/u*	mg/l		lbs/u*	mg/l	% rem		lbs/u*	mg/l	% rem
BOD5	NA	NA	BOD5	NA	NA	NA	BOD5	.15	NA	NA
TSS	NA	NA	TSS	.74	NA	NA	TSS	.45	NA	NA
Oil & Grease	NA	NA	Oil & Grease	.20	NA	NA	Oil & Grease	.065	NA	NA
			pH	Within the range of 6.0 - 9.0			pH	Within the range of 6.0 - 9.0		

* 1000 lb of seafood

NA - Not Available

SUFFICIENT DATA NOT AVAILABLE TO CALCULATE COST AND REMOVALS

INDUSTRY: Canned & Preserved Seafoods

SUBPART C: Machanized Blue Crab

I. Effluent Guidelines

Raw Waste Load			BPT Regulations 40 CFR 408.32 Promulgated: June 26, 1974 Amended:				BAT Regulations 40 CFR 408.33 Promulgated June 26, 1974 Amended:			
	lb/u*	mg/l		lbs/u*	mg/l	% rem		lb/u*	mg/l	% rem
BOD5	NA	NA	BOD5	NA	NA	NA	BOD5	2.5	NA	NA
TSS	NA	NA	TSS	12.0	NA	NA	TSS	6.3	NA	NA
Oil & Grease	NA	NA	Oil & Grease	4.2	NA	NA	Oil & Grease	1.3	NA	NA
			pH	Within the range of 6.0 - 9.0			pH	Within the range of 6.0 - 9.0		

* 1000 lbs of seafood

NA - Not Available

SUFFICIENT DATA NOT AVAILABLE TO CALCULATE COST AND REMOVALS

INDUSTRY: Canned and Preserved Seafoods

SUBPART D: Non-Remote Alaskan Crab Meat

I. Effluent Guidelines

Raw Wasue Load			BPT Regulations 40 CFR 408.42 Promulgated: June 26, 1974 Amended:				BAT Regulations 40 CFR 408.43 Promulgated June 26, 1974 Amended:			
	lbs/u*	mg/l		lbs/u*	mg/l	% rem		lbs/u*	mg/l	% rem
BOD5	NA	NA	BOD5	NA	NA	NA	BOD5	2.0	NA	NA
TSS	NA	NA	TSS	6.2	NA	NA	TSS	.53	NA	NA
Oil & Grease	NA	NA	Oil & Grease	.61	NA	NA	Oil & Grease	.082	NA	NA
			pH	Within the range of 6.0 - 9.0			pH	Within the range of 6.0 - 9.0		

* 1000 lb of seafood
NA - Not Available

SUFFICIENT DATA NOT AVAILABLE TO CALCULATE COST AND REMOVALS

INDUSTRY: Canned and Preserved Seafoods

SUBPART E: Remote Alaskan Crab

I. Effluent Guidelines

Raw Waste Load			BPT Regulations 40 CFR 408.52 Promulgated: Amended:	BAT Regulations 40 CFR 408.53 Promulgated Amended:			
	lbs/u*	mg/l			lb/u*	mg/l	% rem
TSS	NA	NA	No pollutants may be discharged which exceed 1.27 cm (0.5 inch) in any dimension	TSS	5.3	NA	NA
Oil and Grease	NA	NA		Oil & Grease	.52	NA	NA
				pH	Within the range of 6.0 - 9.0		
			*1000 lb of seafood NA - Not Available				

SUFFICIENT DATA NOT AVAILABLE TO CALCULATE COST AND REMOVALS

INDUSTRY: Canned and Preserved Seafoods

SUBPART F: Non-Remote Alaskan Whole Crab and Crab Section

I. Effluent Guidelines

Raw Waste Load			BPT Regulations 40 CFR 408.62 Promulgated: June 26, 1974 Amended:				BAT Regulations 40 CFR 408.63 Promulgated June 26, 1974 Amended:			
	lbs/u*	mg/l		lb/u*	mg/l	% rem		lbs/u*	mg/l	% rem
BOD5	NA	NA	BOD5	NA	NA	NA	BOD5	1.3	NA	NA
TSS	NA	NA	TSS	3.9	NA	NA	TSS	0.33	NA	NA
Oil & Grease	NA	NA	Oil & Grease	.42	NA	NA	Oil & Grease	.048	NA	NA
			pH	Within the range of 6.0 - 9.0			pH	Within the range of 6.0 - 9.0		

* 1000 lb of seafood
NA - Not Available

SUFFICIENT DATA NOT AVAILABLE TO CALCULATE COST AND REMOVALS

INDUSTRY: Canned and Preserved Seafoods

SUBPART G: Remote Alaskan Whole Crab and Crab Section

I. Effluent Guidelines

<table>
<tr><td colspan="3">Raw Waste Load</td><td>BPT Regulations
40 CFR 408.72
Promulgated: June 26, 1974
Amended:</td><td colspan="4">BAT Regulations
40 CFR 408.73
Promulgated June 26, 1974
Amended:</td></tr>
<tr><td></td><td>lb/u*</td><td>mg/l</td><td rowspan="3">No pollutants may be discharged which exceed 1.27 CM (0.5 inch) in any dimension

* 1000 lb of seafood

NA - Not Available</td><td></td><td>lb/u*</td><td>mg/l</td><td>% rem</td></tr>
<tr><td>TSS</td><td>NA</td><td>NA</td><td>TSS</td><td>3.3</td><td>NA</td><td>NA</td></tr>
<tr><td>Oil & Grease</td><td>NA</td><td>NA</td><td>Oil & Grease</td><td>0.36</td><td>NA</td><td>NA</td></tr>
<tr><td></td><td></td><td></td><td></td><td>pH</td><td colspan="3">Within the range of 6.0 - 9.0</td></tr>
</table>

SUFFICIENT DATA NOT AVAILABLE TO CALCULATE COST AND REMOALS

INDUSTRY: Canned and Preserved Seafoods

SUBPART H: Dungeness and Tanner Crab in Contiguous States

I. Effluent Guidelines

Raw Waste Load			BPT Regulations 40 CFR 408.82 Promulgated: June 26. 1974 Amended:				BAT Regulations 40 CFR 408.83 Promulgated June 26, 1974 Amended:			
	lbs/u*	mg/l		lbs/u*	mg/l	% rem		lbs/u*	mg/l	% rem
BOD5	NA	NA	BOD5	NA	NA	NA	BOD5	1.7	NA	NA
TSS	NA	NA	TSS	2.7	NA	NA	TSS	.23	NA	NA
Oil & Grease	NA	NA	Oil & Grease	.61	NA	NA	Oil & Grease	.07	NA	NA
			pH	Within the range of 6.0 - 9.0			pH	Within the range of 6.0 - 9.0		

* 1000 lb of seafood

NA - Not Available

SUFFICIENT DATA NOT AVAILABLE TO CALCULATE COST AND REMOVALS

INDUSTRY: Canned and Preserved Seafoods

SUBPART I: Non-Remote Alaskan Shrimp

I. Effluent Guidelines

Raw Waste Load			BPT Regulations 40 CFR 408.92 Promulgated: June 26, 1974 Amended:				BAT Regulations 40 CFR 408.93 Promulgated June 26, 1974 Amended:			
	lbs/u*	mg/l		lbs/u*	mg/l	% rem		lbs/u*	mg/l	% rem
BOD_5	NA	NA	BOD_5	NA	NA	NA	BOD_5	28	NA	NA
TSS	NA	NA	TSS	210	NA	NA	TSS	18	NA	NA
Oil & Grease	NA	NA	Oil & Grease	17	NA	NA	Oil & Grease	1.5	NA	NA
			pH	Within the range of 6.0 - 9.0			pH	Within the range of 6.0 - 9.0		

*1000 lbs of seafood

NA - Not Available

SUFFICIENT DATA NOT AVAILABLE TO CALCULATE COST AND REMOVALS

INDUSTRY: Canned and Preserved Seafoods

SUBPART J: Remote Alaskan Shrimp

I. Effluent Guidelines

Raw Waste Load

	lbs/u*	mg/l
TSS	NA	NA
Oil and Grease	NA	NA

BPT Regulations
40 CFR 403.102
Promulgated: June 26, 1974
Amended:

No pollutants may be discharged which exceed 1.27 CM (0.5 inch) in any dimension

*1000 lb of seafood

NA - Not Available

BAT Regulations
40 CFR 408.103
Promulgated: June 26, 1974
Amended:

	lbs/u*	mg/l	% rem
TSS	180	NA	NA
Oil & Grease	15	NA	NA
pH	Within the range of 6.0 - 9.0		

SUFFICIENT DATA NOT AVAILABLE TO CALCULATE COST AND REMOVALS

INDUSTRY: Canned and Preserved Seafoods

SUBPART K: Northern Shrimp in Contiguous States

I. Effluent Guidelines

Raw Waste Load			BPT Regulations 40 CFR 408.112 Promulgated: June 26, 1974 Amended:				BAT Regulations 40 CFR 408.113 Promulgated June 26, 1974 Amended:			
	lbs/u*	mg/l		lbs/u*	mg/l	% rem		lbs/u*	mg/l	% rem
BOD5	NA	NA	BOD5	NA	NA	NA	BOD5	27.0	NA	NA
TSS	NA	NA	TSS	54	NA	NA	TSS	4.9	NA	NA
Oil & Grease	NA	NA	Oil & Grease	42	NA	NA	Oil & Grease	3.8	NA	NA
			pH	Within the range of 6.0 - 9.0			pH	Within the range of 6.0 - 9.0		

* 1000 lb of seafood

NA - Not Available

SUFFICIENT DATA NOT AVAILABLE TO CALCULATE COST AND REMOVALS

INDUSTRY: Canned and Preserved Seafoods

SUBPART L: Southern Non-Breaded Shrimp in the Contiguous States

I. Effluent Guidelines

Raw Waste Load			BPT Regulations 40 CFR 408.122 Promulgated: June 26, 1974 Amended:				BAT Regulations 40 CFR 408.123 Promulgated June 26, 1974 Amended:			
	lbs/u*	mg/l		lbs/u*	mg/l	% rem		lbs/u*	mg/l	% rem
BOD5	NA	NA	BOD5	NA	NA	NA	BOD5	10	NA	NA
TSS	NA	NA	TSS	38	NA	NA	TSS	3.4	NA	NA
Oil & Grease	NA	NA	Oil & Grease	12	NA	NA	Oil & Grease	1.1	NA	NA
			pH	Within the range of 6.0 - 9.0			pH	Within the range of 6.0 - 9.0		

* 1000 lb of seafood

NA - Not Available

SUFFICIENT DATA NOT AVAILABLE TO CALCULATE COST AND REMOVALS

INDUSTRY: Canned and Preserved Seafoods

SUBPART N: Tuna Processing

I. Effluent Guidelines

Raw Waste Load			BPT Regulations 40 CFR 408.142 Promulgated: June 26, 1974 Amended:				BAT Regulations 40 CFR 408.143 Promulgated June 26, 1974 Amended:			
	lbs/u*	mg/l		lbs/u*	mg/l	% rem		lbs/u*	mg/l	% rem
BOD5	NA	NA	BOD5	9.0	NA	NA	BOD5	3.62	NA	NA
TSS	NA	NA	TSS	3.3	NA	NA	TSS	.62	NA	NA
Oil & Grease	NA	NA	Oil & Grease	.84	NA	NA	Oil & Grease	.077	NA	NA
			pH	Within the range of 6.0 - 9.0			pH	Within the range of 6.0 - 9.0		

*1000 lbs of seafood

NA - Not Available

SUFFICIENT DATA NOT AVAILABLE TO CALCULATE COST AND REMOVALS

INDUSTRY: Canned and Preserved Seafoods

SUBPART O: Fish Meal Processing

I. Effluent Guidelines

Raw Waste Load			BPT Regulations 40 CFR 408.152 Promulgated: July 30, 1976 Amended:				BAT Regulations 40 CFR 408.153 Promulgated July 30, 1976 Amended:			
Plant with a solubles plant			(1) Any menhaden or achovy Fish meal reduction facility which utilizes a soluble plant to process stick water or bail water:							
	lbs/u*	mg/l		lbs/u*	mg/l	% rem		lbs/u*	mg/l	% rem **
BOD5	0.92	95	BOD5	3.9	--	--	BOD5	3.8	1240	93.9
TSS	2.96	305	TSS	1.5	--	--	TSS	1.5	489	95.7
Oil & Grease	0.56	58	Oil & Grease	0.76	--	--	Oil & Grease	.76	248	96.7
			pH	Within the range of 6.0 - 9.0			pH	Within the range of 6.0 - 9.0		
Plant without a solubles plant			(2) Any menhaden or achovy fish meal reduction facility not covered above:							
BOD5	62.2	20295	BOD5	2.8	914	95.5				
TSS	34.8	11354	TSS	1.7	555	95.1				
Oil & Grease	22.8	7439	Oil & Grease	1.4	457	93.9				
			pH	Within the range of 6.0 - 9.0						

*1000 lbs of seafood

INDUSTRY: Canned and Preserved Seafoods
SUBCATEGORY O: Fish Meal

2. MODEL PLANT ANALYSIS SUMMARY

Plant Flow (MGD)	BPT Annual Cost Millions	BPT Lbs BOD + TSS Removed Millions	BPT $/Lb.	BAT Incremental Annual Cost Millions	BAT Incremental Lbs BOD + TSS Removed Millions	BAT Incremental $/Lb.	Total Annual Cost Millions	Total Lbs BOD + TSS Removed Millions	Total $/Lb.
No costs except for housekeeping for plants using a solubles plant for processing of stick water or bail water									
Other Plants									
0.132	No costs except housekeeping for BPT			0.07	0.06	1.17			

INDUSTRY: Canned and Preserved Seafoods

SUBPART P: Alaskan Hand-Butchered Salmon

I. Effluent Guidelines

Raw Waste Load	BPT Regulations 40 CFR Promulgated: Amended:	BAT Regulations 40 CFR Promulgated Amended:
		No promulgated regulations

INDUSTRY: Canned and Preserved Seafoods

SUBPART Q: Alaskan Mechanized Salmon

I. Effluent Guidelines

Raw Waste Load	BPT Regulations 40 CFR 408.172 Promulgated: Dec 1, 1975 Amended: July 30, 1976	BAT Regulations 40 CFR 408.172 Promulgated Amended:
		Regulations Suspended

SUFFICIENT DATA NOT AVAILABLE TO CALCULATE COST AND REMOVALS

INDUSTRY: Canned and Preserved Seafoods

SUBPART R: West Coast Hand Butchered Salmon

I. Effluent Guidelines

Raw Waste Load			BPT Regulations 40 CFR 408.182 Promulgated: Dec 1, 1975 Amended: July 30, 1976				BAT Regulations 40 CFR 408.183 Promulgated Dec 1, 1975 Amended: July 30, 1976			
	lbs/u*	mg/l		lbs/u*	mg/l	% rem		lbs/u*	mg/l	% rem
BOD5	NA	NA	BOD5	NA	NA	NA	BOD5	1.2	333	NA
TSS	NA	NA	TSS	1.6	444	NA	TSS	.14	39	NA
Oil & Grease	NA	NA	Oil & Grease	.19	53	NA	Oil & Grease	.018	5	NA
			pH	Within the range of 6.0 - 9.0			pH	Within the range of 6.0 - 9.0		

*1000 lbs of seafood

NA - Not Available

INDUSTRY: Canned and Preserved Seafoods
SUBCATEGORY R: West Coast Hand Butchered Salmon

2. MODEL PLANT ANALYSIS SUMMARY

	BPT			BAT			TOTAL		
Plant Flow (MGD)	Annual Cost Millions	Lbs BOD + TSS Removed Millions	$/Lb.	Incremental Annual Cost Millions	Incremental Lbs BOD + TSS Removed (Millions)	Incremental $/Lb.	Total Annual Cost Millions	Total Lbs BOD + TSS Removed Millions	Total $/Lb.
Small Plant									
0.009	NA	NA	NA	0.01	0.006	$1.58	NA	NA	NA
Large Plant									
0.03	NA	NA	NA	0.014	0.02	$ .70	NA	NA	NA

NA - Not Available

INDUSTRY: Canned and Preserved Seafoods

SUBPART S: West Coast Mechanized Salmon

I. Effluent Guidelines

Raw Waste Load			BPT Regulations 40 CFR 408.192 Promulgated: Dec 1, 1975 Amended: July 30, 1976				BAT Regulations 40 CFR 408.193 Promulgated Dec 1, 1975 Amended: July 30, 1976			
	lbs/u*	mg/l		lbs/u*	mg/l	% rem		lbs/u*	mg/l	% rem
BOD5	NA	NA	BOD5	50.8	2726	NA	BOD5	16	859	NA
TSS	NA	NA	TSS	26	1395	NA	TSS	2.5	134	NA
Oil & Grease	NA	NA	Oil & Grease	11	590	NA	Oil & Grease	1.0	54	NA
			pH	Within the range of 6.0 - 9.0			pH	Within the range of 6.0 - 9.0		

* 1000 lb of Seafood

NA - Not Available

INDUSTRY: Canned and Preserved Seafoods
SUBCATEGORY S: West Coast Mechanized Salmon

2. MODEL PLANT ANALYSIS SUMMARY

Plant Flow (MGD)	BPT			BAT			TOTAL		
	Annual Cost Millions	Lbs BOD + TSS Removed Millions	$/Lb.	Incremental Annual Cost Millions	Incremental Lbs BOD + TSS Removed (Millions)	Incremental $/Lb.	Total Annual Cost Millions	Total Lbs BOD + TSS Removed Millions	Total $/Lb.
Small Plant 0.68	NA	NA	NA	0.019	0.15	$0.13	NA	NA	NA
Large Plant 0.179	NA	NA	NA	0.035	0.40	$0.09	NA	NA	NA

NA - Not Available

INDUSTRY: Canned and Preserved Seafoods

SUBPART T: Alaskan Bottom Fish

I. Effluent Guidelines

Raw Waste Load	BPT Regulations 40 CFR 408.22 Promulgated: Amended:	BAT Regulations 40 CFR 408.203 Promulgated Amended:
		BAT Regulations not promulgated

SUFFICIENT DATA NOT AVAILABLE TO CALCULATE COST AND REMOVALS

INDUSTRY: Canned and Preserved Seafoods

SUBPART U: Non-Alaskan Conventional Bottom Fish

I. Effluent Guidelines

Raw Waste Load			BPT Regulations 40 CFR 408.212 Promulgated: Dec 1, 1975 Amended: July 30, 1976				BAT Regulations 40 CFR 408.213 Promulgated Dec 1, 1975 Amended: July 30, 1976			
	lbs/u*	mg/l		lbs/u*	mg/l	% rem		lbs/u*	mg/l	% rem
BOD5	NA	NA	BOD5	3.32	571	NA	BOD5	.71	122	NA
TSS	NA	NA	TSS	2.0	344	NA	TSS	.73	126	NA
Oil & Grease	NA	NA	Oil & Grease	.55	95	NA	Oil & Grease	.042	7	NA
			pH	Within the range of 6.0 - 9.0			pH	Within the range of 6.0 - 9.0		

* 1000 lbs of seafood

NA - Not Available

INDUSTRY: Canned and Preserved Seafoods
SUBCATEGORY U: Non-Alaskan Conventional Bottom Fish

2. MODEL PLANT ANALYSIS SUMMARY

	BPT			BAT			TOTAL		
Plant Flow (MGD)	Annual Cost Millions	Lbs BOD + TSS Removed Millions	$/Lb.	Incremental Annual Cost Millions	Incremental Lbs BOD + TSS Removed (Millions)	Incremental $/Lb.	Total Annual Cost Millions	Total Lbs BOD + TSS Removed Millions	Total $/Lb.
Small Plant									
0.014	NA	NA	NA	0.006	0.016	$0.34	NA	NA	NA
Medium Plant									
0.032	NA	NA	NA	0.008	0.035	$0.24	NA	NA	NA
Large Plant									
0.06	NA	NA	NA	0.01	0.067	$0.15	NA	NA	NA

NA - Not Available

INDUSTRY: Canned and Preserved Seafoods

SUBPART V: Non-Alaskan Mechanized Bottom Fish

I. Effluent Guidelines

Raw Waste Load			BPT Regulations 40 CFR 408.222 Promulgated: Dec 1, 1975 Amended: July 30, 1976				BAT Regulations 40 CFR 408.223 Promulgated Dec 1, 1975 Amended: July 30, 1976			
	lbs/u*	mg/l		lbs/u*	mg/l	% rem		lbs/u*	mg/l	% rem
BOD5	NA	NA	BOD5	11.9	1595	NA	BOD5	3.1	415	NA
TSS	NA	NA	TSS	12	1608	NA	TSS	0.97	130	NA
Oil & Grease	NA	NA	Oil & Grease	3.9	523	NA	Oil & Grease	0.32	43	NA
			pH	Within the range of 6.0 - 9.0			pH	Within the range of 6.0 - 9.0		

*1000 lbs of seafood

NA - Not Available

INDUSTRY: Canned and Preserved Seafoods
SUBCATEGORY V: Non-Alaskan Mechanized Bottom Fish

2. MODEL PLANT ANALYSIS SUMMARY

	BPT			BAT			TOTAL		
Plant Flow (MGD)	Annual Cost Millions	Lbs BOD + TSS Removed Millions	$/Lb.	Incremental Annual Cost Millions	Incremental Lbs BOD + TSS Removed (Millions)	Incremental $/Lb.	Total Annual Cost Millions	Total Lbs BOD + TSS Removed Millions	Total $/Lb.
Small Plant 0.024	NA	NA	NA	0.015	0.057	$0.27	NA	NA	NA
Large Plant 0.087	NA	NA	NA	0.026	0.35	$0.08	NA	NA	NA

NA - Not Available

INDUSTRY: Canned and Preserved Seafoods

SUBPART W: Hand-Shucked Clam

I. Effluent Guidelines

Raw Waste load			BPT Regulations 40 CFR 408.232 Promulgated: Dec 1, 1975 Amended:				BAT Regulations 40 CFR 408.233 Promulgated Dec 1, 1975 Amended:			
	lbs/u*	mg/l		lbs/u*	mg/l	% rem		lbs/u*	mg/l	% rem
TSS	NA	NA	TSS	18	3523	NA	TSS	17	3327	NA
Oil & Grease	NA	NA	Oil & Grease	.23	45	NA	Oil & Grease	.21	41	NA
			pH	Within the range of 6.0 - 9.0			pH	Within the range of 6.0 - 9.0		

*1000 lbs of seafood

NA - Not Available

INDUSTRY: Canned and Preserved Seafoods
SUBCATEGORY W: Hand Shucked Clam

2. MODEL PLANT ANALYSIS SUMMARY

	BPT			BAT			TOTAL		
Plant Flow (MGD)	Annual Cost Millions	Lbs BOD + TSS Removed Millions	$/Lb.	Incremental Annual Cost Millions	Incremental Lbs BOD + TSS Removed (Millions)	Incremental $/Lb.	Total Annual Cost Millions	Total Lbs BOD + TSS Removed Millions	Total $/Lb.
No Costs Except Housekeeping									

INDUSTRY: Canned and Preserved Seafoods

SUBPART X: Mechanized Clam

I. Effluent Guidelines

Raw Waste Load			BPT Regulations 40 CFR 408.242 Promulgated: Dec 1, 1975 Amended:				BAT Regulations 40 CFR 408.243 Promulgated Dec. 1, 1975 Amended:			
	lbs/u*	mg/l		lbs/u*	mg/l	% rem		lbs/u*	mg/l	% rem
BOD5	NA	NA	BOD5	18.7	2744	NA	BOD5	5.7	836	NA
TSS	NA	NA	TSS	15	2201	NA	TSS	4.4	646	NA
Oil & Grease	NA	NA	Oil & Grease	0.97	142	NA	Oil & Grease	0.92	14	NA
			pH	Within the range of 6.0 - 9.0			pH	Within the range of 6.0 -9.0		

* 1000 lbs of seafood

NA - Not Available

INDUSTRY: Canned and Preserved Seafoods
SUBCATEGORY X: Mechanized Clam

2. MODEL PLANT ANALYSIS SUMMARY

Plant Flow (MGD)	BPT			BAT			TOTAL		
	Annual Cost Millions	Lbs BOD + TSS Removed Millions	$/Lb.	Incremental Annual Cost Millions	Incremental Lbs BOD + TSS Removed (Millions)	Incremental $/Lb.	Total Annual Cost Millions	Total Lbs BOD + TSS Removed Millions	Total $/Lb.
Small Plant 0.13	NA	NA	NA	$0.01	0.74	$.01	NA	NA	NA
Large Plant 0.433	NA	NA	NA	$0.018	2.5	$.01	NA	NA	NA

NA - Not Available

INDUSTRY: Canned and Preserved Seafoods

SUBPART Y: Pacific Coast Hand-Shucked Oyster

I. Effluent Guidelines

Raw Waste Load			BPT Regulations 40 CFR 408.252 Promulgated: Dec 1, 1975 Amended: July 30, 1976				BAT Regulations 40 CFR Promulgated Dec 1, 1975 Amended: July 30, 1976			
	lbs/u*	mg/l		lbs/u*	mg/l	% rem		lbs/u*	mg/l	% rem
TSS	NA	NA	TSS	38	660	NA	TSS	36	625	NA
Oil & Grease	NA	NA	Oil & Grease	1.8	31	NA	Oil & Grease	1.7	30	NA
			pH	Within the range of 6.0 - 9.0			pH	Within the range of 6.0 - 9.0		

*1000 lb of Seafoods
NA - Not Available

INDUSTRY: Canned and Preserved Seafoods
SUBCATEGORY Y: Pacific Cost Hand-Shucked Oyster

2. MODEL PLANT ANALYSIS SUMMARY

	BPT			BAT			TOTAL		
Plant Flow (MGD)	Annual Cost Millions	Lbs BOD + TSS Removed Millions	$/Lb.	Incremental Annual Cost Millions	Incremental Lbs BOD + TSS Removed (Millions)	Incremental $/Lb.	Total Annual Cost Millions	Total Lbs BOD + TSS Removed Millions	Total $/Lb.
		No Costs Except Housekeeping							

INDUSTRY: Canned and Preserved Seafoods

SUBPART Z: Atlantic and Gulf Coast Hand-Shucked Oyster

I. Effluent Guidelines

Raw Waste Load			BPT Regulations 40 CFR 408.262 Promulgated: Dec 1, 1975 Amended: July 30, 1976				BAT Regulations 40 CFR 408.263 Promulgated Dec 1, 1975 Amended: July 30, 1976			
	lbs/u*	mg/l		lbs/u*	mg/l	% rem		lbs/u*	mg/l	% rem
TSS	NA	NA	TSS	16	556	NA	TSS	16	556	NA
Oil & Grease	NA	NA	Oil & Grease	.81	28	NA	Oil & Grease	.77	27	NA
			pH	Within the range of 6.0 - 9.0			pH	Within the range of 6.0 - 9.0		

* 1000 lb of seafood
NA - Not Available

INDUSTRY: Canned and Preserved Seafoods
SUBCATEGORY Z: Atlantic and Gulf Coast Hand-Shucked Oyster

2. MODEL PLANT ANALYSIS SUMMARY

	BPT			BAT			TOTAL		
Plant Flow (MGD)	Annual Cost Millions	Lbs BOD + TSS Removed Millions	$/Lb.	Incremental Annual Cost Millions	Incremental Lbs BOD + TSS Removed Millions	Incremental $/Lb.	Total Annual Cost Millions	Total Lbs BOD + TSS Removed Millions	Total $/Lb.
				NO COSTS EXCEPT HOUSEKEEPING					

INDUSTRY: Canned and Preserved Seafoods

SUBPART AA: Steam & Canned Oyster

I. Effluent Guidelines

Raw Waste Load

	lbs/u*	mg/l
BOD5	NA	NA
TSS	NA	NA
Oil & Grease	NA	NA

BPT Regulations
40 CFR 408.272
Promulgated: Dec 1, 1975
Amended:

	lbs/u*	mg/l	% rem
BOD5	61.2	978	NA
TSS	190	3028	NA
Oil & Grease	17	27	NA
pH	Within the range of 6.0 - 9.0		

* 1000 lbs of seafood
NA - Not Available

BAT Regulations
40 CFR 408.273
Promulgated Dec 1, 1975
Amended: Feb 4, 1977

	lbs/u*	mg/l	% rem
BOD5	17	272	NA
TSS	39	624	NA
Oil & Grease	.42	8	NA
pH	Within the range of 6.0 - 9.0		

INDUSTRY: Canned and Preserved Seafoods
SUBCATEGORY AA: Steam and Canned Oyster

2. MODEL PLANT ANALYSIS SUMMARY

	BPT			BAT			TOTAL		
Plant Flow (MGD)	Annual Cost Millions	Lbs BOD + TSS Removed Millions	$/Lb.	Incremental Annual Cost Millions	Incremental Lbs BOD + TSS Removed Millions	Incremental $/Lb.	Total Annual Cost Millions	Total Lbs BOD + TSS Removed Millions	Total $/Lb.
0.108	NA	NA	NA	0.008	0.31	.03	NA	NA	NA

NA - Not Available

INDUSTRY: Canned and Preserved Seafoods

SUBPART AB: Sardine

I. Effluent Guidelines

Raw Waste Load

	lbs/u*	mg/l
TSS	NA	NA
Oil & Grease	NA	NA

BPT Regulations
40 CFR 408.282
Promulgated: Dec 1, 1975
Amended:

(1) Any sardine processing facility which utilizes dry transportaiton systems from the fish storage area to the fish processing area

	lbs/u*	mg/l	% rem
TSS	10	1380	NA
Oil & Grease	1.4	193	NA
pH	Within the range of 6.0 - 9.0		

(2) Any Sardine processing facility covered (above)

	lbs/u*	mg/l	% rem
TSS	16	2208	NA
Oil & Grease	2.8	386	NA
pH	Within the range of 6.0 - 9.0		

*1000 lbs of seafood

BAT Regulations
40 CFR 408.283
Promulgated Dec 1, 1975
Amended:

	lbs/u*	mg/l	% rem
TSS	10	1380	NA
Oil & Grease	.52	75	NA
pH	Within the range of 6.0 - 9.0		

INDUSTRY: Canned and Preserved Seafoods
SUBCATEGORY AB: Sardine (with dry transport system)

2. MODEL PLANT ANALYSIS SUMMARY

Plant Flow (MGD)	BPT			BAT			TOTAL		
	Annual Cost Millions	Lbs BOD + TSS Removed Millions	$/Lb.	Incremental Annual Cost Millions	Incremental Lbs BOD + TSS Removed Millions	Incremental $/Lb.	Total Annual Cost Millions	Total Lbs BOD + TSS Removed Millions	Total $/Lb.
Small plant 0.029	NA	NA	NA	0.014	0.002	7.84	NA	NA	NA
Medium plant 0.077	NA	NA	NA	0.022	0.005	4.79	NA	NA	NA
Large Plant 0.116	NA	NA	NA	0.028	0.007	3.96	NA	NA	NA

NA - Not Available

INDUSTRY: Canned and Preserved Seafoods
SUBCATEGORY AB: Sardine (without dry transport system)

V. MODEL PLANT ANALYSIS SUMMARY

Plant Flow (MGD)	BPT			BAT			TOTAL		
	Annual Cost Millions	Lbs BOD + TSS Removed Millions	$/Lb.	Incremental Annual Cost Millions	Incremental Lbs BOD + TSS Removed Millions	Incremental $/Lb.	Total Annual Cost Millions	Total Lbs BOD + TSS Removed Millions	Total $/Lb.
Small plant 0.029	NA	NA	NA	0.014	0.017	0.83	NA	NA	NA
Medium Plant 0.077	NA	NA	NA	0.022	0.044	0.51	NA	NA	NA
Large Plant 0.116	NA	NA	NA	0.028	0.066	0.42	NA	NA	NA

INDUSTRY: Canned and Preserved Seafoods

SUBPART AC: Alaskan Scallop

I. Effluent Guidelines

Raw Waste Load	BPT Regulations 40 CFR 408.292 Promulgated: Dec 1, 1975 Amended:	BAT Regulations 40 CFR 408.293 Promulgated Amended:
		No BAT regulations promulgated

INDUSTRY: Canned and Preserved Seafoods

SUBPART AD: Non-Alaskan Scallop

I. Effluent Guidelines

Raw Waste Load			BPT Regulations 40 CFR 408.302 Promulgated: Dec 1, 1979 Amended:				BAT Regulations 40 CFR 408.303 Promulgated Dec 1, 1975 Amended:			
	lbs/u*	mg/l		lbs/u*	mg/l	% rem		lbs/u*	mg/l	% rem
TSS	NA	NA	TSS	1.4	167	NA	TSS	1.4	167	NA
Oil & Grease	NA	NA	Oil & Grease	0.24	29	NA	Oil & Grease	0.23	27	NA
			pH	Within the range of 6.0 -9.0			pH	Within the range 6.0 - 9.0		

*1000 lbs of seafood

NA - Not Available

INDUSTRY: Canned and Preserved Seafoods
SUBCATEGORY AD: Non-Alaskan Scallop

2. MODEL PLANT ANALYSIS SUMMARY

	BPT			BAT			TOTAL		
Plant Flow (MGD)	Annual Cost Millions	Lbs BOD + TSS Removed Millions	$/Lb.	Incremental Annual Cost Millions	Incremental Lbs BOD + TSS Removed Millions	Incremental $/Lb.	Total Annual Cost Millions	Total Lbs BOD + TSS Removed Millions	Total $/Lb.
				NO COSTS EXCEPT FOR HOUSEKEEPING					

INDUSTRY: Canned and Preserved Seafoods

SUBPART AE: Alaskan Herring Fillet

I. Effluent Guidelines

Raw Waste Load	BPT Regulations 40 CFR 408.312 Promulgated: *Amended:*	BAT Regulations 40 CFR 408.313 Promulgated Amended:
		BAT regulations suspended

INDUSTRY: Canned and Preserved Seafoods

SUBPART AF: Non-Alaskan Herring Fillet

I. Effluent Guidelines

Raw Waste Load			BPT Regulations 40 CFR 408.322 Promulgated: Dec 1, 1975 Amended:				BAT Regulations 40 CFR 408.323 Promulgated Dec 1, 1975 Amended:			
	lbs/u*	mg/l		lbs/u*	mg/l	% rem		lbs/u*	mg/l	% rem
BOD5	NA	NA	BOD5	32.2	3681	NA	BOD5	6.2	709	NA
TSS	NA	NA	TSS	24	2744	NA	TSS	1.8	206	NA
Oil & Grease	NA	NA	Oil & Grease	10	1143	NA	Oil & Grease	0.73	83	NA
			pH	Within the range of 6.0 - 9.0			pH	Within the range of 6.0 - 9.0		

* 1000 lbs of seafood

NA- Not Available

INDUSTRY: Canned and Preserved Seafoods
SUBCATEGORY AF: Non-Alaskan Herring Fillet

2. MODEL PLANT ANALYSIS SUMMARY

	BPT			BAT			TOTAL		
Plant Flow (MGD)	Annual Cost Millions	Lbs BOD + TSS Removed Millions	$/Lb.	Incremental Annual Cost Millions	Incremental Lbs BOD + TSS Removed Millions	Incremental $/Lb.	Total Annual Cost Millions	Total Lbs BOD + TSS Removed Millions	Total $/Lb.
0.375	NA	NA	NA	0.076	1.7	.04	NA	NA	NA

NA - Not Available

INDUSTRY: Canned and Preserved Seafoods

SUBPART AG: Abalone Processing

I. Effluent Guidelines

Raw Waste Load			BPT Regulations 40 CFR 408.332 Promulgated: Dec 1, 1975 Amended:				BAT Regulations 40 CFR 408.333 Promulgated Dec 1, 1975 Amended:			
	lbs/u*	mg/l		lbs/u*	mg/l	% rem		lbs/u*	mg/l	% rem
TSS	NA	NA	TSS	.15	5556	NA	TSS	14	5185	NA
Oil & Grease	NA	NA	Oil & Grease	1.4	519	NA	Oil & Grease	1.3	481	NA
			pH	Within the range of 6.0 - 9.0			pH	Within the ____ 6.0 - 9.0		

*1000 lbs of seafood

NA - Not Available

INDUSTRY: Canned and Preserved Seafoods
SUBCATEGORY AG: Abalone Processing

V. MODEL PLANT ANALYSIS SUMMARY

	BPT			BAT			TOTAL		
Plant Flow (MGD)	Annual Cost Millions	Lbs BOD + TSS Removed Millions	$/Lb.	Incremental Annual Cost Millions	Incremental Lbs BOD + TSS Removed Millions	Incremental $/Lb.	Total Annual Cost Millions	Total Lbs BOD + TSS Removed Millions	Total $/Lb.
				NO COSTS EXCEPT FOR HOUSEKEEPING					

I. Effluent Guidelines

Raw Waste Load	BPT Regulations 40 CFR 409.12 Promulgated: Jan. 31, 1974 Amended:	BAT Regulations 40 CFR 409.13 Promulgated Jan 31, 1974 Amended: Aug. 20, 1975
For barometric condensing operations discharge only	(a) The following limitations establish the maximum permissable discharge of process waste water pollutants when the process waste water discharge results from barometric condensing operations only.	(a) Less than 2300 tons per day of beets sliced, or where the soil filtration rate is less than or equal to 0.159 cm (1/16 in) per day. (1) Barometric condensers only
lbs/u* mg/l	lbs/u* mg/l % rem	lbs/u* mg/l % rem
BOD5 NA NA TSS NA NA	BOD5 2.2 NA NA TSS pH Within the range of 6.0 - 9.0 Temp: Temperture not to exceed the temperature of cooled water acceptable for return to the heat producing process and in no event greater than 90 degrees F	BOD5 1.3 NA NA TSS pH Within the range of 6.0 - 9.0 Temp: Not to exceed the temperature of cooled water acceptable for return to the heat producing process and in no event greater than 90 F
	(b) The following limitations establish the maximum permissable discharge of process waste water pollutants when the process waste water discharge results, in whole or in part, from barometric condensing operations and any other beet sugar processing operation.	(2) Barometric Condensers and other beet sugar processing operations BOD5 1.3 TSS 1.3 pH Within the range of 6.0-9.0

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	lbs/u*	mg/l
BOD5	20.0	1845
TSS	74.9	6908

	lbs/u*	mg/l	% rem
BOD5	2.2	203	89.0
TSS	2.2	203	97.1
pH	Within the range of 6.0 - 9.0		
Fecal Col:	Not to exceed MPN of 400/100 ml at any time		
Temp:	Not to exceed 90 F		

*1000 lbs of beets processed

NA - Not Available

Fecal Col: Not to exceed MPN of 400/100 ml at any time

Temp Not to exceed 90 F

(b) For all instances not specified under paragraph (a).

There shall be no discharge of process water pollutants to navigable waters.

INDUSTRY: Sugar Processing
SUBCATEGORY A: Beet Sugar

2. MODEL PLANT ANALYSIS SUMMARY

	BPT			BAT			TOTAL		
Plant Flow (MGD)	Annual Cost Millions	Lbs BOD + TSS Removed Millions	$/Lb.	Incremental Annual Cost Millions	Incremental Lbs BOD + TSS Removed Millions	Incremental $/Lb.	Total Annual Cost Millions	Total Lbs BOD + TSS Removed Millions	Total $/Lb.
9.36	0.032	78.2	.01	0.098	3.8	.03	0.13	82.0	.01

INDUSTRY: Sugar Processing

SUBPART B: Crystalline Cane Sugar Refining

I. Effluent Guidelines

Raw Waste Load

Process water and barometric condenser cooling water

	lbs/u*	mg/l
BOD5	3.70	52
TSS	18.40	258

Barometric Condenser Cooling water only

	lbs/u*	mg/l
BOD5	1.12	17

Process water only

	lbs/u*	mg/l
BOD5	2.58	759
TSS	18.40	5412

BPT Regulations

40 CFR 409.22
Promulgated: Mar. 20, 1974
Amended:

(1) Process waters and barometric condenser cooling water

	lbs/u*	mg/l	% rem
BOD5	.86	12	76.8
TSS	.18	3	99.0
pH	Within the range of 6.0 - 9.0		

(2) Barmetric Condenser cooling water only

	lbs/u*	mg/l	% rem
BOD5	.68	10	39.3

* ton of melt

BAT Regulations

40 CFR 409.23
Promulgated Mar. 20, 1974
Amended:

	lbs/u*	mg/l	% rem
BOD5	.18	62	95.1
TSS	.07	24	99.6
pH	Within the range of 6.0 - 9.0		

INDUSTRY: Sugar Processing
SUBCATEGORY B: Crystalline Cane Sugar Refining

2. MODEL PLANT ANALYSIS SUMMARY

	BPT			BAT			TOTAL		
Plant Flow (MGD)	Annual Cost Millions	Lbs BOD + TSS Removed Millions	$/Lb.	Incremental Annual Cost Millions	Incremental Lbs BOD + TSS Removed Millions	Incremental $/Lb.	Total Annual Cost Millions	Total Lbs BOD + TSS Removed Millions	Total $/Lb.
Small 3.5	0.29	3.2	.09	0.11	0.119	.91	.39	3.278	.12
Large 17.9	0.41	11.1	.04	0.24	0.415	.58	.65	11.472	.06

INDUSTRY: Sugar Processing

SUBPART C: Liquid Cane Sugar Refining

I. Effluent Guidelines

Raw Waste Load			BPT Regulations 40 CFR 409.32 Promulgated: March 20, 1974 Amended:				BAT Regulations 40 CFR 409.32 Promulgated March 20, 1974 Amended:			
Barometric condenser cooling water and other process waters			(1) Barametric condenser cooling water and other process waters							
	lbs/u*	mg/l		lbs/u*	mg/l	% rem		lbs/u*	mg/l	% rem
BOD5	7.45	220	BOD5	.63	37	91.6	BOD5	.30	158	96.0
TSS	17.80	527	TSS	.33	20	98.1	TSS	.06	32	99.7
			pH	Within the range of 6.0 - 9.0			pH	Within the range of 6.0 - 9.0		
Barometric condenser cooling water only			(2) Barometric condenser cooling water only							
BOD5	1.00	33	BOD5	.30		70.0				
			* Ton of melt							
Process water only										
BOD5	6.45	3395								
TSS	17.80	9368								

INDUSTRY: Sugar Processing
SUBCATEGORY C: Liquid Cane Sugar Refining

2. MODEL PLANT ANALYSIS SUMMARY

	BPT			BAT			TOTAL		
Plant Flow (MGD)	Annual Cost Millions	Lbs BOD + TSS Removed Millions	$/Lb.	Incremental Annual Cost Millions	Incremental Lbs BOD + TSS Removed Millions	Incremental $/Lb.	Total Annual Cost Millions	Total Lbs BOD + TSS Removed Millions	Total $/Lb.
2.3	.32	3.1	.10	0.49	0.76	.64	.369	3.2	.12

INDUSTRY: Sugar Processing

SUBPART D: Louisianna Raw Cane Sugar

I. Effluent Guidelines

Raw Waste Load	BPT Regulations 40 CFR 409.42 Promulgated: Feb. 27, 1975 Amended:	BAT Regulations 40 CFR Promulgated Amended:
		No promulgated BAT regulations

INDUSTRY: Sugar Processing

SUBPART E: Floriada and Texas Raw Cane Sugar

I. Effluent Guidelines

Raw Waste Load	BPT Regulations 40 CFR 409.52 Promulgated: Feb. 27, 1975 Amended:	BAT Regulations 40 CFR Promulgated Amended:
	There shall be no discharge of process waste water pollutants to navigable waters (a) Process waste water pollutants in the overflow may be discharged to navigable waters whenever rainfall events cause an overflow of process waste water from a facility designed, constructed, and operated to contain all process generated waste waters	No regulations promulgated

INDUSTRY: Sugar Processing

SUBPART F: Hilo-Hamakua Coast

I. Effluent Guidelines

Raw Waste Load	BPT Regulations 40 CFR 409.62 Promulgated: Feb. 27, 1975 Amended:	BAT Regulations 40 CFR 409.63 Promulgated Amended:
		BAT regulations suspended

INDUSTRY: Sugar Processing

SUBPART G: Hawaiian Raw Cane Sugar

I. Effluent Guidelines

Raw Waste Load	BPT Regulations 40 CFR 409.72 Promulgated: Feb. 27, 1975 Amended:	BAT Regulations 40 CFR 409.73 Promulgated Amended:
	There shall be no discharge of process waste water pollutants to navigable waters. (a) Process waste water pollutants in the overflow may be discharged to navigable waters whenever rainfall events cause an overflow of process waste water from a facility designed, constructed, and operated to contain all process generated waste waters	BAT Regulations not promulgated

INDUSTRY: Sugar Processing

SUBPART H: Puerto Rican Raw Cane Sugar

I. Effluent Guidelines

Raw Waste Load	BPT Regulations 40 CFR 409.82 Promulgated: Feb. 27, 1975 Amended:	BAT Regulations 40 CFR Promulgated Amended:
		No BAT regulations promulgated

INDUSTRY: Cement Manufacturing

SUBPART A: Non Leaching

I. Effluent Guidelines

Raw Waste Load	BPT Regulations 40 CFR 411.12 Promulgated: Feb. 29, 1974 Amended:				BAT Regulations 40 CFR 411.13 Promulgated Feb 20, 1974 Amended:		
		lbs/u*	mg/l	% rem	lbs/u*	mg/l	% rem
	TSS	.005	NA	NA	.005	NA	NA
	Temp	Not to exceed 3 C rise above inlet temperature			Not to exceed 3 C rise above inlet temperature		
	pH	Within the range of 6.0 - 9.0			Within the range of 6.0 - 9.0		

* 1000 lb of product
NA - Not Available

INDUSTRY: Cement

SUBPART B: Leaching

I. Effluent Guidelines

Raw Waste Load			BPT Regulations 40 CFR 411.22 Promulgated: Feb 20, 1974 Amended:				BAT Regulations 40 CFR 411.23 Promulgated Feb 20, 1974 Amended:			
	lbs/u	mg/l		lbs/u*	mg/l	% rem		lbs/u	mg/l	% rem
TSS	.91	124	TSS	0.4	55	56.0	TSS	0.005	0.7	99.6
			Temp (heat)	Not to exceed 3 C rise above inlet tempature			Temp (heat)	Not to exceed 3 C rise above inlet tempature		
			pH	Within the range of 6.0 - 9.0			pH	Within the range of 6.0 - 9.0		
			*1000 lb of dust leached							

INDUSTRY: Cement
SUBCATEGORY: Leaching Plants

2. MODEL PLANT ANALYSIS SUMMARY

	BPT			BAT			TOTAL		
Plant Flow (MGD)	Annual Cost Millions	Lbs BOD + TSS Removed Millions	$/Lb.	Incremental Annual Cost Millions	Incremental Lbs BOD + TSS Removed Millions	Incremental $/Lb.	Total Annual Cost Millions	Total Lbs BOD+ TSS Removed Millions	Total $/Lb.
.13	.18	1.0	.18	.13	.03	4.49	.31	1.044	.30

INDUSTRY: Cement Manufacturing

SUBPART C: Materials Storage Piles Runoff

I. Effluent Guidelines

Raw Waste Load	BPT Regulations 40 CFR 411.32 Promulgated: Feb. 20, 1974 Amended:	BAT Regulations 40 CFR 411.33 Promulgated Feb 20, 1974 Amended:
	(a)	(a)
	TSS Not to exceed 50 mg/l	TSS Not to exceed 50 mg/l
	pH Within the range of 6.0 - 9.0	pH Within the range of 6.0 - 9.0
	(b) Any untreated overflow from facilities designed, constructed and operated to treat the volume of runoff from materials storage piles which is associated with a 10 year, 24 hour rainfall event shall not be subject to the pH and TSS limitations stipulated in pagaragraph (a).	(b) Any untreated overflow from facilities designed, constructed and operated to treat the volume of runoff from materials storage piles which is assoicated with a 10 year, 24 hour rainfall event shall not be subject to the pH and TSS limitations stipulated in pagaragraph (a).

INDUSTRY: Feedlots

SUBPART A: All Subcategories Except Ducks

I. Effluent Guidelines

Raw Waste Load	BPT Regulations 40 CFR 412.12 Promulgated: Feb. 14.1974 Amended:	BAT Regulations 40 CFR 412.13 Promulgated Feb 14, 1974 Amended:
	(a) There shall be no discharge of process waste water pollutants to navigable waters. (b) Process waste pollutants in the overflow may be discharged to navigable waters whenever rainfall events, either chronic or catastrophic cause an overflow of process waste water from a facility designed, constructed and operated to contain all process generated waste waters plus the runoff from a 10 year, 24 hour rainfall event for the location of the point source	(a) There shall be no discharge of process waste water pollutants to navigable waters. (b) Process waste pollutants in the overflow may be discharged to navigable waters whenever rainfall events, either chronic or catastrophic cause an overflow of process waste water from a facility designed. constructed and operated to contain all process generated waste waters plus the runoff from a 25 year, 24 hour rainfall event for the location of the point source

INDUSTRY: Feedlots

SUBPART B: Ducks

I. Effluent Guidelines

Raw Waste Load	BPT Regulations 40 CFR 412.22 Promulgated: Feb. 14. 1974 Amended:	BAT Regulations 40 CFR 412.23 Promulgated Feb. 14, 1974 Amended:
	| | lbs/u* | mg/l | % rem | BOD5 | 2.00 | NA | NA Fecal | Not to exceed MPN of 400/100 ml at any time *1000 ducks Note: This subcategory was not amenable to analysis in detail. NA - Not Available	(a) There whall be no discharge of process waste water pollutants to navigable waters. (b) Process waste pollutants in the overflow may be discharged to navigable waters whenever rainfall events, either chronic or catastrophic, cause an overflow of process waste water from a facility designed, constructed and operated to contain all process generated waste waters plus the runoff from a 25 year, 24 hour rainfall event for the location of the point source

INDUSTRY: Phosphate Manufacturing

SUBPART A: Phosphate Producing

I. Effluent Guidelines

Raw Waste Load			BPT Regulations 40 CFR 422.12 Promulgated: Feb. 20, 1974 Amended:				BAT Regulations 40 CFR 422.13 Promulgated: Feb. 20, 1964 Amended:
	lb/u	mg/l		lb/u*	mg/l	% rem	
TSS	35.7	500.4	TSS	0.5	7.0	98.6	Regulations remanded by court.
Total Phosphrous			Total Phosphrous	.15			
Fluoride			Fluoride	.05			
Elemental Phosphorous			Elemental Phosphorous	No detectable quantity			
			pH	With the range of 6.0 - 9.0			

* 1000 lb. of product

INDUSTRY: Phosphate Manufacturing

SUBPART B: Phosphorus Consuming

I/ Effluent Guidelines

Raw Waste Load	40 CFR 422.22 Promulgated: Feb. 20, 1974 Amended:	40 CFR 422.22 Promulgated: Feb. 20, 1974 Amended:
	(a) There shall be no discharge of process waste water pollutants to navigable waters from the manufacture of phosphoric acid, phosphorus pentoxide, or phosphorus pentasulfide	
	(b) Manufacture of phosphours trichloride	
lbs/u mg/l	lbs/u mg/l % rem	
TSS 4.5 8277 Total Phosphorous Arsenic Elemental Phosphorous	TSS .7 1291 84.4 Total Phosphorous .8 Arsenic .00005 Elemental Phosphorous No detectable quantity pH Within the range of 6.0 - 9.0	Regulations remanded by court.
	(c)Production of oxycholoride	
TSS .99 4000 Total Phosphorus pH	TSS .15 603.2 84.9 Total Phosphorous .17 pH Within the range of 6.0 - 9.0	
	* 1000 lb of product	

INDUSTRY: Phosphate Manufacturing

SUBPART C: Phosphate

I/ Effluent Guidelines

Raw Waste Load	BPT Regulations 40 CFR 422.32 Promulgated: Feb. 20, 1974 Amended:	BAT Regulations 40 CFR 422.33 Promulgated Feb. 20, 1974 Amended:
lbs/u mg/l TSS 10.0 Total Phosphorous	(a) There shall be no discharge of process waste water pollutants to navigable waters from the manufacture of sodium tripolyphoshate, or animal feed grade calcium phosphate (b) Manufacture of human food grade calcium phosphate lbs/u mg/l % rem TSS .06 99.4 Total Phosphorous .03 pH Within the range of 6.0 - 9.0	Regulations remanded by court.

INDUSTRY: Phosphate Manufacturing

SUBPART D: Defluorinated Phosphate Rock

I/ Effluent Guidelines

Raw Waste load	BPT Regulations 40 CFR 422.42 Promulgated: Feb. 20, 1974 Amended:	BAT Regulations 40 CFR 422.43 Promulgated Feb. 20, 1974 Amended:
	(a) Subject to (b),(c) and (d): There shall be no discharge of process waste water pollutants to navigable waters. (b) Process wastewater pollutants from a cooling water recirculation system designed, constructed and operated to maintain a surge capacity equal to the runoff from the 10-year 24 hour rainfall event may be discharged, after treatment to the standards set forth in paragraph (c) of this section, whenever chronic or catastrophic precipitation events cause the water level in the pond to rise into the surge capacity (c) The concentration of pollutants discharged in process wastewater pursuant to the limitations of paragraph (b) of this section shall not exceed	(a) Subject to (b),(c) and (d): There shall be no discharge of process waste water pollutants to navigable waters. (b) Process wastewater pollutants from a cooling water recirculation system designed, constructed and operated to maintain a surge capacity equal to the runoff from the 25-year 24 hour rainfall event may be discharged, after treatment to the standards set forth in pargagraph (c) of this section, whenever chronic or catastrophic precipitation events cause the water level in the pond to rise into the surge capacity (c) The concentration of pollutants discharged in process wastewater pursuant to the limitations of paragraph (b) of this section shall not exceed

	mg/l	% rem
Total Phosphorous	35	
Fluoride	25	
TSS	50	
pH	Within the range of 6.0 - 9.0	

(d) The concentration of pollutants discharged in contaminated non-process wastewater shall not exceed

	mg/l	% rem
Total Phosphorus	35	
Fluoride	20	
pH	Within the range of 6.0 - 9.0	

	mg/l	% rem
Total Phosphorous	35	
Fluoride	25	
TSS	50	
pH	Within the range of 6.0 - 9.0	

(d) The concentration of pollutants discharged in contaminated non-process wastewater shall not exceed

	mg/l	% rem
Total Phosphorus	35	
Fluoride	20	
pH	Within the range of 6.0 - 9.0	

INDUSTRY: Phosphate Manufacturing

SUBPART E: Defluorinated Phosphoric Acid

I/ Effluent Guidelines

Raw Waste Load	BPT Regulations 40 CFR 422.52 Promulgated: June 23, 1976 Amended:	BAT Regulations 40 CFR 422.53 Promulgated June 23, 1976 Amended:
	(a) Subject to provisions of paragraph (b)(c) and (d) There shall be no discharge of process waste water pollutants to navigable waters (b) process waste water pollutants from a cooling water recirculation system designed, constructed and operated to maintain a surge capacity equal to the runoff from the 10-year, 24 hour rainfall event may be discharged, after treatment to the standards set forth in paragraph (c) of this section, whenever chronic or catastrophic precipitation events cause the water level in the pond to rise into the surge capacity. (c) The concentration of pollutants discharged in process wastewater pursuant to the limitations of paragraph (b) of this section shall not exceed.	(a) Subject to provisions of paragraph (b)(c) and (d) There shall be no discharge of process waste water pollutants to navigable waters (b) process waste water pollutants from a cooling water recirculation system designed, constructed and operated to maintain a surge capacity equal to the runoff from the 25-year, 24 hour rainfall event may be discharged, after treatment to the standards set forth in paragraph (c) of this section, whenever chronic or catastrophic precipitation events cause the water level in the pond to rise into the surge capacity. (c) The concentration of pollutants discharged in process wastewater pursuant to the limitations of paragraph (b) of this section shall not exceed.

mg/l % rem	mg/l % rem
Total Phosphorus 35 Fluoride 25 TSS 50 pH Within the range of 6.0 - 9.0	Total Phosphorus 35 Fluoride 25 TSS 50 pH Within the range of 6.0 - 9.0
(d) The concentration of pollutants discharged in contaminated non-process wastewater shall not exceed:	(d) The concentration of pollutants discharged in contaminated non-process wastewater shall not exceed:
Total Phosphorus 35 Fluoride 25 pH Within the range of 6.0 - 9.5	Total Phosphorus 35 Fluoride 25 pH Within the range of 6.0 - 9.5

INDUSTRY: Phosphate Manufacturing

SUBPART F: Sodium phosphate

I. Effluent Guidelines

Raw Waste Load			BPT Regulations 40 CFR 422.62 Promulgated: June 23, 1976 Amended:				BAT Regulations 40 CFR 422.63 Promulgated: June 23, 1976 Amended:			
	lbs/u	mg/l		lbs/u*	mg/l	% rem		lbs/u	mg/l	% rem
TSS	4.4	459.8	TSS	.25	25.6	94.4	TSS	.18	18.4	95.9
Total Phosphorus			Total Phosphorus	.40	NA	NA	Total Phosphorus	.28	NA	NA
Fluoride			Fluoride	.15	NA	NA	Fluoride	.11	NA	NA
pH			pH	Within the range of 6.0 - 9.5			pH	Within the range of 6.0 - 9.5		

* 1000 lb. of product
NA - Not Available

INDUSTRY: Phosphate Manufacturing
SUBCATEGORY F: Sodium Phosphate

2. MODEL PLANT ANALYSIS SUMMARY

	BPT (TSS Only)			BAT			TOTAL		
Plant Flow (MGD)	Annual Cost Millions	Lbs BOD + TSS Removed Millions	$/Lb.	Incremental Annual Cost Millions	Incremental Lbs BOD + TSS Removed Millions	Incremental $/Lb.	Total Annual Cost Millions	Total Lbs BOD + TSS Removed Millions	Total $/Lb.
			Minimal costs associated with meeting BAT						

INDUSTRY: Ferroalloys

SUBPART A: Open Electric Furnances with Wet Air Pollution Control Devices

I. Effluent Guidelines

Raw Waste Load

	lb/u*	mg/l
TSS	52.8	1460
Chromium Total	.172	4.76
Chromium VI	.012	0.32
Manganese Total	22.17	613

BPT Regulations
40 CFR 424.12
Promulgated; Feb. 22, 1974
Amended:

	lbs/u*	mg/l	% rem
TSS	.352	25.0	99.3
Chromium Total	.007	0.5	95.9
Chromium VI	.0007	.05	42
Manganese Total	.070	5.0	99.7
pH	Within the range of 6.0 - 9.0		

* Megawatt hour of electric energy consumed

BAT Regulations
40 CFR 424.13
Promulgated Feb 22, 1974
Amended:

	lbs/u*	mg/l	% rem
TSS	.026	15.0	99.95
Chromium Total	.0009	0.5	99.5
Chromium VI	.0001	0.05	99.2
Manganese	.0086	5.0	99.96
pH	Within the range of 6.0 - 9.0		

INDUSTRY: Ferroalloy Manufacturing
SUBCATEGORY A: Open Electric Furnaces with Wet Air Pollution Control Devices

2. MODEL PLANT ANALYSIS SUMMARY

	BPT			BAT			TOTAL		
Plant Flow (MGD)	Annual Cost Millions	LBS BOD + TSS Removed Millions	$/Lb.	Incremental Annual Cost Millions	Incremental Lbs BOD + TSS Removed Millions	Incremental $/Lb.	Total Annual Cost Millions	Total Lbs BOD + TSS Removed Millions	Total $/Lb.
BPT 1.0	0.25	10.9	0.02	0.057	0.068	0.84	0.3	11.3	0.03
BAT 0.123									

INDUSTRY: Ferroalloy Manufacturing

SUBPART B: Covered Electric Furnaces and Other Smelting Operations with Wet Air Pollution Control Devices

I. Effluent Guidelines

Raw Waste Load

	lbs/u*	mg/l
TSS	28.67	1555
Chromium Total	0.088	4.76
Chromium VI	0.006	0.32
Manganese Total	8.24	4.47
Cyanide Total	0.046	2.49
Phenols	0.134	7.27

BPT Regulations
51 CGS 424.22
Promulgated:Feb 22, 1974
Amended: May 21, 1974

	lbs/u*	mg/l	% rem
TSS	.461	25.0	98.4
Chromium Total	.009	0.5	89.8
Chromium VI	.0009	0.05	85.0
Manganese	.092	5.0	98.9
Cyanide	.005	0.25	89.1
Phenols	.009	0.5	93.3
pH	Within the range of 6.0 - 9.0		

*megawatt hours of electrical energy consumed,

BAT Regulations
51 CGS 424.23
Promulgated Feb 22, 1974
Amended: May 21, 1974

	lbs/u*	mg/l	% rem
TSS	.035	15.0	99.88
Chromium Total	.0012	0.5	98.64
Chromium VI	.0001	0.05	98.33
Manganese	.012	5.0	99.85
Cyanide	.0006	0.25	98.70
Phenols	.0005	0.2	99.63
pH	Within the range of 6.0 - 9.0		

INDUSTRY: Ferroalloy Manufacturing
SUBCATEGORY B: Covered Electric Furnaces and Other Smelting Operations with Wet Air Pollution Control Devices

2. MODEL PLANT ANALYSIS SUMMARY

	BPT			BAT			Total		
Plant Flow (MGD)	Annual Cost Millions	Lbs BOD + TSS Removed Millions	$/Lb.	Incremental Annual Cost Millions	Incremental Lbs BOD + TSS Removed Millions	Incremental $/Lb.	Total Annual Cost Millions	Total Lbs BOD TSS Removed Millions	Total $/Lb.
BPT 2.9	0.7	12.9	0.05	0.16	0.19	0.83	0.87	13.1	0.07
BAT 0.365									

INDUSTRY: Ferroalloy Manufacturing

SUBPART C: Slag Processing

I. Effluent Guidelines

Raw Waste Load			BPT Regulations 40 CFR 424.32 Promulgated: Feb. 22, 1974 Amended:				BAT Regulations 40 CFR 424.33 Promulgated Feb. 22, 1974 Amended:			
	lbs/u*	mg/l		lbs/u*	mg/l	% rem		lbs/u*	mg/l	% rem
TSS	91.9	864.0	TSS	2.659	25.0	97.1	TSS	.271	25.0	99.71
Chromium Total	0.217	2.04	Chromium	.053	0.5	75.6	Chromium	.0054	0.5	97.51
Manganese	5.74	54.0	Manganese	.532	5.0	90.7	Manganese	.052	5.0	99.09
			pH	Within the range of 6.0 - 9.0			pH	Within the range of 6.0 - 9.0		

* ton processed

INDUSTRY: Ferroalloy Manufacturing
SUBCATEGORY C: Slag Processing

2. MODEL PLANT ANALYSIS SUMMARY

	BPT			BAT			Total		
Plant Flow (MGD)	Annual Cost Millions	Lbs BOD + TSS Removed Millions	$/Lb.	Incremental Annual Cost Millions	Incremental Lbs BOD + TSS Removed Millions	Incremental $/Lb.	Total Annual Cost Millions	Total Lbs BOD TSS Removed Millions	Total $/Lb.
BPT 2.45	0.12	6.0	0.02	.003	0.16	0.02	0.12	6.2	0.02
BAT 0.250									

INDUSTRY: Ferroalloy Manufacturing

SUBPART D: Covered Calcium Carbide Furnaces With Wet Air Pollution Control Devices

I. Effluent Guidelines

Raw Waste Load			BPT Regulations 40 CFR 424.42 Promulgated: Feb. 24,1975 Amended:				BAT Regulations 40 CFR 424.43 Promulgated Feb 24, 1975 Amended:		
	lbs/u*	mg/l		lbs/u*	mg/l	% rem		lbs/u*	mg/l	% rem
TSS	166	4740	TSS	.190	25.33	99.89	TSS	.11	14.7	99.93
Total Cyanide	0.203	27	Cyanide	.0028	0.37	98.62	Cyanide	.0028	0.37	98.62
			pH	Within the range of 6.0 - 9.0			pH	Within the range of 6.0 - 9.0		

* 1000 lb of product

INDUSTRY: Ferroalloy Manufacturing
SUBCATEGORY D: Covered Calcium Carbide Furnaces with Wet Air Pollution Control Devices

2. MODEL PLANT ANALYSIS SUMMARY

	BPT			BAT			Total		
Plant Flow (MGD)	Annual Cost Millions	Lbs BOD + TSS Removed Millions	$/Lb.	Incremental Annual Cost Millions	Incremental Lbs BOD + TSS Removed Millions	Incremental $/Lb.	Total Annual Cost Millions	Total Lbs BOD TSS Removed Millions	Total $/Lb.
1.1	0.011	49.7	.01	0.038	0.024	1.58	0.049	49.8	.01

INDUSTRY: Ferroalloy Manufacturing

SUBPART E: Other Calcium Carbide Furnaces

I. Effluent Guidelines

Raw Waste Load	BPT Regulations 40 CFR 424.52 Promulgated: Feb. 24, 1975 Amended:	BAT Regulations 40 CFR 424.53 Promulgated Feb. 24, 1975 Amended:
	There shall be no discharge of process waste water pollutants to navigable waters.	There shall be no discharge of process waste water pollutants to navigable waters.

INDUSTRY: Ferroalloy Manufacturing

SUBPART F: Electrolytic Manganese Products

I. Effluent Guidelines

Raw Waste Load

(a) Production of electrolytic manganese

	lbs/u*	mg/l
TSS	900.6	55,444.0
Manganese	124.2	6,828.0
Ammonia-N	87.1	4,354.0

(b) Production of electrolytic manganese dioxide

TSS	770.5	22,505
Manganese	108.3	3,158
Ammonia-N	2.7	75

BPT Regulations
40 CFR 424.62
Promulgated: Feb. 27, 1975
Amended:

(a) Production of electrolytic manganese

	lbs/u*	mg/l	% rem
TSS	3.389	25	99.62
Manganese	1.356	10	98.91
Ammonia-N	20.334	150	76.65
pH	Within the range of 6.0 - 9.0		

(b) Production of electrolytic manganese dioxide

TSS	.881	25	99.89
Manganese	.352	10	99.67
Ammonia-N	5.287	150	-95.81
pH	Within the range of 6.0 - 9.0		

* 1000 lb of product

BAT Regulations
40 CFR 424.63
Promulgated Feb. 27, 2975
Amended:

(a) Production of electrolytic manganese

	lbs/u*	mg/l	% rem
TSS	1.695	25	99.81
Manganese	.339	5	99.73
Ammonia-N	3.389	50	96.11
pH	Within the range of 6.0 - 9.0		

(b) Production of electrolytic manganese dioxide

TSS	.441	25	99.94
Manganese	.088	5	99.92
Ammonia-N	.881	50	67.37
pH	Within the range of 6.0 - 9.0		

INDUSTRY: Ferroalloy Manufacturing
SUBCATEGORY F: Electrolytic Manganese Products

2. MODEL PLANT ANALYSIS SUMMARY

Plant Flow (MGD)	BPT Annual Cost Millions	BPT Lbs BOD + TSS Removed Millions	BPT $/Lb.	BAT Incremental Annual Cost Millions	BAT Incremental Lbs BOD + TSS Removed Millions	BAT Incremental $/Lb.	Total Annual Cost Millions	Total Lbs BOD TSS Removed Millions	Total $/Lb.
BPT 1.3	0.17	17.9	0.01	0.049	0.034	1.45	0.22	18.0	0.01
BAT 0.65									

INDUSTRY: Ferroalloy Manufacturing

SUBPART G: Electrolytic Chromium

I. Effluent Guidelines

Raw Waste Load			BPT Regulations 40 CFR 424.72 Promulgated: Feb. 27, 1975 Amended:				BAT Regulations 40 CFR 424.73 Promulgated Feb. 27, 1975 Amended:			
	lbs/u*	mg/l		lbs/u*	mg/l	% rem		lbs/u*	mg/l	% rem
TSS	30.5	290	TSS	2.638	25	91.35	TSS	1.325	25	95.66
Manganese	5.5	52	Manganese	1.055	10	80.82	Manganese	.264	5	95.20
Chromium	186.1	1764	Chromium	.053	0.5	99.97	Chromium	.027	0.5	99.99
Ammonia-N	113.5	1076	Ammonia-N	5.276	50	95.35	Ammonia-N	2.649	50	97.67
			pH	Within the range of 6.0 - 9.0			pH	Within the range of 6.0 - 9.0		

* 1000 lb of product

INDUSTRY: Ferroalloy Manufacturing
SUBCATEGORY G: Electrolytic Chromium

2. MODEL PLANT ANALYSIS SUMMARY

	BPT			BAT			TOTAL		
Plant Flow (MGD)	Annual Cost Millions	Lbs BOD + TSS Removed Millions	$/Lb.	Incremental Annual Cost Millions	Incremental Lbs BOD + TSS Removed (Millions)	Incremental $/Lb.	Total Annual Cost Millions	Total Lbs BOD + TSS Removed Millions	Total $/Lb.
BPT 1.0	0.53	0.56	$.94	0.052	0.026	1.98	0.58	0.58	0.99
BAT 0.5									

INDUSTRY: Glass Manufacturing

SUBPART A: Insulation Fiberglass

I. Effluent Guidelines

Raw Waste Load	BPT Regulations 40 CFR 426.12 Promulgated: Jan 22, 1974 Amended: Feb. 7, 1974	BAT Regulations 40 CFR 426.13 Promulgated Jan 22, 1974 Amended:
	(a) There shall be no discharge of process waste water pollutants to navigable waters. (b) Waste water from advanced air emission control devices lbs/u* mg/l % rem Phenol .0003 NA NA COD .165 NA NA BOD5 .012 NA NA TSS .015 NA NA pH Within the range of 6.0 - 9.0 * 1000 lb of NA - Not Available	(a) There shall be no discharge of process waste water pollutants to navigable waters.

INDUSTRY: Glass Manufacturing
SUBCATEGORY A: Insulation Fiberglass

2. MODEL PLANT ANALYSIS SUMMARY

	BPT			BAT			TOTAL		
Plant Flow (MGD)	Annual Cost Millions	Lbs BOD + TSS Removed Millions	$/Lb.	Incremental Annual Cost Millions	Incremental Lbs BOD + TSS Removed (Millions)	Incremental $/Lb.	Total Annual Cost Millions	Total Lbs BOD TSS Removed Millions	Total $/Lb.
COST AND POUNDS OF REMOVAL NOT AVAILABLE									

INDUSTRY: Glass Manufacturing

SUBPART B: Sheet Glass

I. Effluent Guidelines

Raw Waste Load	BPT Regulations 40 CFR 426.22 Promulgated: Feb. 14, 1974 Amended:	BAT Regulations 40 CFR 426.23 Promulgated Feb. 14, 1974 Amended:
	There shall be no discharge of process waste water pollutants to navigable waters.	There shall be no discharge of process waste water pollutants to navigable waters.

INDUSTRY: Glass Manufacturing

SUBPART C: Rolled Glass

I. Effluent Guidelines

Raw Waste Load	BPT Regulations 40 CFR 426.32 Promulgated: Feb. 14. 1974 Amended:	BAT Regulations 40 CFR 426.33 Promulgated Feb. 14, 1974 Amended:
	There shall be no discharge of process waste water pollutants to navigable waters.	There shall be no discharge of process waste water pollutants to navigable waters.

INDUSTRY: Glass Manufacturing

SUBPART D: Plate Glass

I. Effluent Guidelines

Raw Waste Load			BPT Regulations 40 CFR 426.42 Promulgated: Feb. 14, 1974 Amended:				BAT Regulations 40 CFR 426.43 Promulgated Feb. 14, 1974 Amended:		
	lbs/u*	mg/l		lbs/u*	mg/l	% rem		lbs/u*	mg/l	% rem
TSS	1380	15,000	TSS	2.76	30	99.8	TSS	.090	5	99.99
			pH	Within the range of 6.0 - 9.0			pH	Within the range of 6.0 - 9.0		

* ton of product

INDUSTRY: Glass Manufacturing
SUBCATEGORY D: Plate Glass

2. MODEL PLANT ANALYSIS SUMMARY

Plant Flow (MGD)	BPT Annual Cost Millions	BPT Lbs BOD + TSS Removed Millions	BPT $/Lb.	BAT Incremental Annual Cost Millions	BAT Incremental Lbs BOD + TSS Removed (Millions)	BAT Incremental $/Lb.	TOTAL Total Annual Cost Millions	TOTAL Total Lbs BOD TSS Removed Millions	TOTAL Total $/Lb.
BPT 7.3									
	.05	227.2	.00	.147	.44	.33	.19	227.7	.00
BAT 1.5									

INDUSTRY: Glass Manufacturing

SUBPART E: Float Glass

I. Effluent Guidelines

Raw Waste Load

	lbs/u*	mg/l
TSS	.0040	15
Oil	.0028	5
Phosphorus	-	-

BPT Regulations
40 CFR 426.52
Promulgated: Feb 14, 1974
Amended:

	lbs/u*	mg/l	% rem
TSS	.0040	15	0
Oil	.0028	5	0
Phosphorus	.0001	-	-
pH	Within the range of 6.0 - 9.0		

* ton of product

BAT Regulations
40 CFR 426.53
Promulgated Feb. 14, 1974
Amended:

	lbs/u*	mg/l	% rem
TSS	.0014	5	65
Oil	.0028	5	0
Phosphorus	.0001	-	-
pH	Within the range of 6.0 - 9.0		

INDUSTRY: Glass Manufacturing
SUBCATEGORY E: Float Glass

2. MODEL PLANT ANALYSIS SUMMARY

	BPT			BAT			TOTAL		
Plant Flow (MGD)	Annual Cost Millions	Lbs BOD + TSS Removed Millions	$/Lb.	Incremental Annual Cost Millions	Incremental Lbs BOD + TSS Removed (Millions)	Incremental $/Lb.	Total Annual Cost Millions	Total Lbs BOD TSS Removed Millions	Total $/Lb.
.05	-*	-*	-*	.001	.0001	14.42	-*	-*	-*

*No costs are associated for BPT because technology consists of elimination of detergent usage

INDUSTRY: Glass Manufacturing

SUBPART F: Automotive Glass Tempering

I. Effluent Guidelines

Raw Waste Load			BPT Regulations 40 CFR 426.62 Promulgated: Feb. 14, 1974 Amended:				BAT Regulations 40 CFR 426.63 Promulgated Feb 14, 1974 Amended:			
	lbs/u*	mg/l		lbs/u*	mg/l	% rem		lbs/u*	mg/l	% rem
TSS	1.0	100	TSS	.25	25	75	TSS	.05	5	95
Oil	.13	13	Oil	.13	13	-	Oil	.10	5	23
			pH	Within the range of 6.0 - 9.0			pH	Within the range of 6.0 - 9.0		

* 1000 sq. ft. of product

INDUSTRY: Glass Manufacturing
SUBCATEGORY F: Automotive Glass Tempering

2. MODEL PLANT ANALYSIS SUMMARY

	BPT			BAT			TOTAL		
Plant Flow (MGD)	Annual Cost Millions	Lbs BOD + TSS Removed Millions	$/Lb.	Incremental Annual Cost Millions	Incremental Lbs BOD + TSS Removed Millions	Incremental $/Lb.	Total Annual Cost Millions	Total Lbs BOD TSS Removed Millions	Total $/Lb.
.18	.034	.028	1.19	.025	.009	2.88	.059	.037	1.59

INDUSTRY: Glass Manufacturing

SUBPART G: Automotive Glass Laminating

I. Effluent Guidelines

Raw Waste Load

	lbs/u*	mg/l
TSS	.45	25
Oil	30.5	1700
Phosphorus	.20	5.6

BPT Regulations
40 CFR 426.72
Promulgated: Feb 14, 1974
Amended:

	lbs/u*	mg/l	% rem
TSS	.90	25	0
Oil	.36	10	98.8
Phosphorus	.22	5.6	0
pH	Within the range of 6.0 - 9.0		

BAT Regulations
40 CFR 426.73
Promulgated Feb 14, 1974
Amended:

	lbs/u*	mg/l	% rem
TSS	.18	5	60
Oil	.36	5	98.8
Phosphorus	.06	1	70
pH	Within the range of 6.0 - 9.0		

* 1000 sq. ft of product

INDUSTRY: Glass Manufacturing
SUBCATEGORY G: Automotive Glass Laminating

2. MODEL PLANT ANALYSIS SUMMARY

	BPT			BAT			TOTAL		
Plant Flow (MGD)	Annual Cost Millions	Lbs BOD + TSS Removed Millions	$/Lb.	Incremental Annual Cost Millions	Incremental Lbs BOD + TSS Removed Millions	Incremental $/Lb.	Total Annual Cost Millions	Total Lbs BOD TSS Removed Millions	Total $/Lb.
.14	.020	.49	.04	.025	.005	5.58	.046	.496	.09

INDUSTRY: Glass Manufacturing

SUBPART H: Glass Container

I. Effluent Guidelines

Raw Waste Load			BPT Regulations 40 CFR 426.82 Promulgated: Jan 16, 1975 Amended:				BAT Regulations 40 CFR 426.83 Promulgated Jan 16, 1975 Amended:			
	lbs/u*	mg/l		lbs/u*	mg/l	% rem		lbs/u*	mg/l	% rem
Oil	.03	10	Oil	.03	10	0	Oil	.0008	25	97
TSS	.07	24	TSS	.07	24	0	TSS	.0008	25	99
			pH	Within the range of 6.0 - 9.0			pH	Within the range of 6.0 - 9.0		

* 1000 lb of furnace pull

Note: Increased concentrations at BAT are due to significantly decreased flows

INDUSTRY: Glass Manufacturing
SUBCATEGORY H: Glass Container

2. MODEL PLANT ANALYSIS SUMMARY

Plant Flow (MGD)	BPT Annual Cost Millions	BPT Lbs BOD + TSS Removed Millions	BPT $/Lb.	BAT Incremental Annual Cost Millions	BAT Incremental Lbs BOD + TSS Removed Millions	BAT Incremental $/Lb.	TOTAL Total Annual Cost Millions	TOTAL Total Lbs BOD TSS Removed Millions	TOTAL Total $/Lb.
BPT .35 BAT .009	NA	NA	NA	.093	.025	3.80	NA	NA	NA

NA - NOT AVAILABLE

INDUSTRY: Glass Manufacturing

SUBPART I: Machine Pressed and Blown Glass

I. Effluent Guidelines		
Raw Waste Load	BPT Regulations 40 CFR 426.92 Promulgated: Amended:	BAT Regulations 40 CFR 426.93 Promulgated Amended:
	No Regulations	No Regulations

INDUSTRY: Glass Manufacturing

SUBPART J: Glass Tubing (Danner) Manufacturing

I. Effluent Guidelines

Raw Waste Load			BPT Regulations 40 CFR 426.102 Promulgated: Jan. 16, 1975 Amended:				BAT Regulations 40 CFR 426.103 Promulgated Jan. 16, 1975 Amended:			
	lbs/u*	mg/l		lbs/u*	mg/l	% rem		lbs/u*	mg/l	% rem
TSS	.23	27	TSS	.23	27	0	TSS	.0002	10	99.9
			pH	Within the range of 6.0 - 9.0			pH	Within the range of 6.0 - 9.0		

* 1000 lb of furnace pull

INDUSTRY: Glass Manufacturing
SUBCATEGORY J: Glass Tubing (Danner) Manufacturing

2. MODEL PLANT ANALYSIS SUMMARY

Plant Flow (MGD)	BPT Annual Cost Millions	BPT Lbs BOD + TSS Removed Millions	BPT $/Lb.	BAT Incremental Annual Cost Millions	BAT Incremental Lbs BOD + TSS Removed Millions	BAT Incremental $/Lb.	TOTAL Total Annual Cost Millions	TOTAL Total Lbs BOD TSS Removed Millions	TOTAL Total $/Lb.
BPT .2									
	NA	NA	NA	.03	.001	1.76	NA	NA	NA
BAT .0005									

NA - NOT AVAILABLE

INDUSTRY: Glass Manufacturing

SUBPART K: Television Picture Tube Envelope

I. Effluent Guidelines

Raw Waste Load

	lbs/u*	mg/l
Oil	.13	10
TSS	4.2	335
Fluoride	1.8	143
Lead	.39	30

BPT Regulations
40 CFR 426.112
Promulgated: Jan 16, 1975
Amended:

	lbs/u*	mg/l	% rem
Oil	.13	10	0
TSS	.15	12	96.4
Fluoride	.07	5.6	96.1
Lead	.0045	.36	98.9
pH	Within the range of 6.0 - 9.0		

* 1000 lb of furnace pull

BAT Regulations
40 CFR 426.113
Promulgated Jan 16, 1975
Amended:

	lbs/u*	mg/l	% rem
Oil	.13	10	0
TSS	.13	10	96.9
Fluoride	.06	4.8	96.7
Lead	.00045	.036	99.9
pH	Within the range of 6.0 - 9.0		

INDUSTRY: Glass Manufacturing
SUBCATEGORY K: Television Picture Tube Envelope

2. MODEL PLANT ANALYSIS SUMMARY

Plant Flow (MGD)	BPT Annual Cost Millions	BPT Lbs BOD + TSS Removed Millions	BPT $/Lb.	BAT Incremental Annual Cost Millions	BAT Incremental Lbs BOD + TSS Removed Millions	BAT Incremental $/Lb.	TOTAL Total Annual Cost Millions	TOTAL Total Lbs BOD TSS Removed Millions	TOTAL Total $/Lb.
.82	—*	—*	—*	.02	.003	8.56	—*	—*	—*

*No costs are associated to BPT treatment because at the time of the study BPT technology was the existing treatment in the industry

INDUSTRY: Glass Manufacturing

SUBPART L: Incandescent Lamp Envelope

I. Effluent Guidelines

Raw Waste Load

	lbs/u*	mg/l
Oil	.115	15
TSS	.115	58

Fluoride	11.1	1200
Ammonia	2.6	2.81
TSS	.400	58

BPT Regulations
40 CFR 426.122
Promulgated: Jan 16, 1975
Amended:

(a) Forming operations

	lbs/u*	mg/l	% rem
Oil	.115	15	0
TSS	.115	39	0
Ph	Within the range of 6.0 - 9.0		

(b) Finishing operations

	lbs/u*	mg/l	% rem
Fluoride	.115	12.4	99.0
Ammonia	no Limitation		
TSS	.23	39	42.5
pH	Within the range of 6.0 - 9.0		

* 1000 lb of furnace pull
** 1000 lb of product frosted

BAT Regulations
40 CFR 426.123
Promulgated Jan 16, 1975
Amended:

(a) Forming operations

	lbs/u*	mg/l	% rem
Oil	.045	3	61
TSS	.045	7	61
pH	Within the range of 6.0 - 9.0		

(b) Finishing Operations

	lbs/u**	mg/l	% rem
Fluoride	.052	5.6	95.5
Ammonia	No Limitation		
TSS	.04	7	90.0
pH	Within the range of 6.0 - 9.0		

INDUSTRY: Glass Manufacturing
SUBCATEGORY L: Incandescent Lamp Envelope

2. MODEL PLANT ANALYSIS SUMMARY

	BPT			BAT			TOTAL		
Plant Flow (MGD)	Annual Cost Millions	Lbs BOD + TSS Removed Millions	$/Lb.	Incremental Annual Cost Millions	Incremental Lbs BOD + TSS Removed Millions	Incremental $/Lb.	Total Annual Cost Millions	Total Lbs BOD TSS Removed Millions	Total $/Lb.
.189	__*	__*	__*	.42	.016	26.29	__*	__*	__*

*No costs are associated with BPT because BPT did not require any additional treatment.

INDUSTRY: Glass Manufacturing

SUBPART M: Hand Pressed and Blown Glass

I. Effluent Guidelines

Raw Waste Load		BPT Regulations 40 CFR 426.132 Promulgated: Amended: January 16, 1975	BAT Regulations 40 CFR 426.133 Promulgated Amended: January 16,1975		
	mg/l	No Limitation	(a) More than 50 gallons/day and employs hydrofluoric acid finishing techniques		
				mg/l	% rem
Lead	11.4		lead	.1	99.1
Fluoride	422		Fluoride	13.0	96.9
TSS	544		TSS	10.0	98.2
			pH	Within the range of 6.0 - 9.0	
			(b) More than 50 gallons/day, employs hydrofluric acid finishing techniques and produces non-leaded glassware		
Fluoride	9600		Fluoride	13.0	99.9
TSS	NA		TSS	10.0	NA
			pH	Within the range of 6.0 - 9.0	
TSS			(c) More than 50 gallons/day and does not employ hydrofluoric acid finishing techniques		
		NA - Not Available	TSS	10.0	
			pH	Within the range of 6.0 - 9.0	

INDUSTRY: Meat Products

SUBPART A: Simple Slaughterhouses

I. Effluent Guidelines

Raw Waste Load

	lbs/u*	mg/l
BOD5	6.0	1126
TSS	5.6	1051
O&G	2.1	394
Ammonia	0.68	128

BPT Regulations
40 CFR 432.12
Promulgated: Feb. 28, 1974
Amended:

	lbs/u*	mg/l	% rem
BOD5	.12	22	98
TSS	.20	37	96
Oil & Grease	.06	11	97
Ammonia	No Limitation		
Fecal Coliform	Maximum at any time 400 mpn/100 ml		
pH	Within the range of 6.0 - 9.0		

BAT Regulations
40 CFR 432.13
Promulgated Feb 28, 1974
Amended: July 19, 1974

	lbs/u*	mg/l	% rem
BOD5	.03	11	99.5
TSS	.05	18	99.1
Oil & Grease	.03	10**	98.6
Ammonia	.01	4.0	98.5
Fecal Coliform	Maximum at any time 400 mpn/100 ml		
pH	Within the range of 6.0 - 9.0		

Additional discharges are allowed for processing of hides, processing of blood, and rendering

* 1000 lb Live weight killed
** Daily maximum, 30 day average not controlled

INDUSTRY: Meat Products

SUBPART B: Complex Slaughterhouses

I. Effluent Guidelines

Raw Waste Load

	lbs/u	mg/l
BOD5	10.9	1477
TSS	9.6	1301
Oil & Grease	5.9	800
Ammonia	.84	112
Fecal coliform		

BPT Regulations
40 CFR 432.22
Promulgated: Feb. 28, 1974
Amended: July 19, 1974

	lbs/u*	mg/l	% rem
BOD5	.21	28	98.1
TSS	.25	33	97.4
Oil & Grease	.08	11	98.6
Ammonia	No Limitation		
Fecal Coliform	Maximum at any one time 400 MPN/100 ml		
pH	Within the range of 6.0 - 9.0		

BAT Regulations
40 CFR 432.23
Promulgated FEb. 28, 1974
Amended:

	lbs/u	mg/l	% rem
BOD5	.04	11	99.6
TSS	.07	19	99.3
Oil & Grease	.074	10.0**	98.7
Ammonia	.03	4.0**	96.4
Fecal Coliform		Maximum at any one time 400 MPN/100 ml	
pH	Within the range of 6.0 - 9.0		

Additional dicharges are allowed for the processing of hides, processing of blood, and rendering.

* 1000 lb live weight killed
** Maximum daily, 30 day average not controlled

INDUSTRY: Meat Products

SUBPART C: Low processing Packinghouses

I. Effluent Guidelines

Raw Waste Load			BPT Regulations 40 CFR 432.32 Promulgated: Feb. 28, 1974 Amended:				BAT Regulations 40 CFR 432.33 Promulgated Feb 28, 1974 Amended:			
	lbs/u	mg/l		lbs/u*	mg/l	% rem		lbs/u	mg/l	% rem
BOD5	8.1	1033	BOD5	.17	20	97.9	BOD5	.04	10	99.5
TSS	5.9	752	TSS	.24	29	95.9	TSS	.06	14	99.0
Oil & Grease	3.0	383	Oil & Grease	.08	10	97.3	Oil & Grease		10.0**	
Ammonia	0.53	68	Ammonia	No Limitation			Ammonia	.017	4.0	96.8
			Fecal Coliform	Maximum at any time 400 MPN/100 ml			Fecal Coliform	Maximum at any time 400 MPN/100 ml		
			pH	Within the range of 6.0 - 9.0			pH	Within the range of 6.0 - 9.0		

Additional discharges are allowed for processing of hides, processing of blood, and rendering.

* 1000 lb live weight killed

** Maximum daily, 30 day average not controlled

INDUSTRY: Meat Products

SUBPART D: High Processing Packinghouses

I. Effluent Guidelines

Raw Waste Load			BPT Regulations 40 CFR 432.42 Promulgated: Feb. 28, 1974 Amended:				BAT Regulations 40 CFR 432.43 Promulgated Feb. 28. 1974 Amended:		
	lbs/u	mg/l		lbs/u	mg/l	% rem		lbs/u	mg/l	% rem
BOD5	16.1	1287	BOD5	.24	19	98.5	BOD5	.08	13	99.5
TSS	10.5	839	TSS	.31	25	97.0	TSS	.10	16	99.0
Ammonia	1.25	100	Ammonia	No Limitation			Ammonia	.025	4.0	98.0
Oil & Grease	9.0	719	Oil & Grease	.13	10	98.6	Oil & Grease		10.0	
Fecal Coliform			Fecal Coliform	Maximum at any time 400 MPN/100 ml			Fecal Coliform	Maximum at any time 400 MPN/100 ml		
			pH	Within the range of 6.0 - 9.0			pH	Within the range of 6.0 - 9.0		

Additional discharges are allowed processing of hides, processing of blood, and rendering.

* 1000 lb live weight killed
** Maximum Daily, 30 day average not controlled

INDUSTRY: Meat Products

SUBPART E: Small Processor

I. Effluent Guidelines

Raw Waste Load			BPT Regulations 40 CFR 432.52 Promulgated: Jan 3, 1975 Amended:				BAT Regulations 40 CFR Promulgated Jan. 3, 1975 Amended:			
	lbs/u*	mg/l		lbs/u*	mg/l	%rem		lbs/u	mg/l	% rem
BOD5	NA	NA	BOD5	1.0	NA	NA	BOD5	0.5	NA	NA
TSS	NA	NA	TSS	1.2	NA	NA	TSS	0.6	NA	NA
Oil & Grease	NA	NA	Oil & Grease	.5	NA	NA	Oil & Grease	0.25	NA	NA
			Fecal Coliform	No limitation			Fecal Coliform	No limitation		
			pH	Within the range 6.0 - 9.0			pH	Within the range 6.0 - 9.0		

*1000 lb of product

NO COST ASSOCIATED WITH BAT

NA - NOT AVAILABLE

INDUSTRY: Meat Products

SUBPART F: Meat Cutter

I. Effluent Guidelines

Raw Waste Load

	lbs/u*	mg/l
BOD5	0.52	867.0
TSS	0.64	1067.0
Oil & Grease	0.12	200.0
Ammonia	0.78	1.3

BPT Regulations

40 CFR 432.62
Promulgated: Jan. 3, 1975
Amended:

	lbs/u*	mg/l	% rem
BOD5	.018	25	96.5
TSS	.022	30	96.6
Oil & Grease	.006	10	95.0
Ammonia	No Limitation		
Fecal Coliform	Maximum at any time 400 MPN/100 ml		
pH	Within the range of 6.0 - 9.0		

* 1000 pounds of finished product

BAT Regulations

40 CFR 432.63
Promulgated Jan 3, 1975
Amended:

	lbs/u*	mg/l	% rem
BOD5	.009	30	98.3
TSS	.012	40	98.1
Oil & Grease	.006	20	95.0
Ammonia	.0012	4	99.8
Fecal Coliform	Maximum at any time 400 MPN/100 ml		
pH	Within the range of 6.0 - 9.0		

INDUSTRY: Meat Products
SUBCATEGORY F: Meat Cutter

2. MODEL PLANT ANALYSIS SUMMARY

	BPT			BAT			TOTAL		
Plant Flow (MGD)	Annual Cost Millions	Lbs BOD + O&G TSS Removed Millions	$/Lb.	Incremental Annual Cost Millions	Incremental Lbs BOD + O&G TSS Removed Millions	Incremental $/Lb.	Total Annual Cost Millions	Total Lbs BOD+ O&G TSS Removed Millions	Total $/Lb.
	NO COSTS AVAILABLE								

INDUSTRY: Meat Products

SUBPART G: Sausage and Lunch Meats

I. Effluent Guidelines

Raw Waste Load			BPT Regulations 40 CFR 432.72 Promulgated: Jan 3, 1975 Amended:				BAT Regulations 40 CFR 432.73 Promulgated Jan 3, 1975 Amended:			
	lbs/u*	mg/l		lbs/u*	mg/l	% rem		lbs/u*	mg/l	% rem
BOD5	2.65	276	BOD5	.28	29	89.4	BOD5	.14	29	94.7
TSS	3.46	360	TSS	.34	35	90.2	TSS	.19	40	94.5
Oil & Grease	1.22	127	Oil & Grease	.10	10	91.8	Oil and Grease	.10	20	91.8
Ammonia	14.59	1.52	Ammonia	No Limitation			Ammonia	0.019	4.0	99.9
			Fecal Coliform	Maximum at any time 400 MPN/100 mg			Fecal Coliform	Maximum at any time 400 MPN/100 mg		
			pH	Within the range of 6.0 - 9.0			pH	Within the range of 6.0 - 9.0		

* 1000 lb of finished product

INDUSTRY: Meat Products
SUBCATEGORY G: Sausage and Lunch Meats

2. MODEL PLANT ANALYSIS SUMMARY

	BPT			BAT			TOTAL		
Plant Flow (MGD	Annual Cost Millions	Lbs BOD + O&G TSS Removed Millions	$/Lb.	Incremental Annual Cost Millions	Incremental Lbs BOD + O&G TSS Removed Millions	Incremental $/Lb.	Total Annual Cost Millions	Total Lbs BOD + O&G TSS Removed Millions	Total $/Lb.
BPT .098 BAT .049	.003	.141	.02	.0	.006	.0	.033	.147	0.02

INDUSTRY: Meat Products

SUBPART H: Ham Processor

I. Effluent Guidelines

Raw Waste Load			BPT Regulations 40 CFR 432.82 Promulgated:Jan. 3, 1975 Amended:				BAT Regulations 40 CFR 432.83 Promulgated Jan 3. 1975 Amended:			
	lbs/u*	mg/l		lbs/u*	mg/l	% rem		lbs/u*	mg/l	% rem
BOD5	5.5	519.0	BOD5	.31	29	94.4	BOD5	.16	30	97.1
TSS	3.28	309.0	TSS	.37	35	88.7	TSS	.21	40	93.6
Oil & Grease	2.37	224.0	Oil & Grease	.11	10	95.4	Oil and Grease	.11	21	95.4
Ammonia	16.11	1.52	Ammonia	No Limitation			Ammonia	.021	4.0	99.9
			Fecal Coliform	Maximum at any one 400 MPN/100 ml			Fecal Coliform	Maximum at any one time 400 MPN/100 ml		
			pH	Within the range of 6.0 - 9.0			pH	Within the range of 6.0 - 9.0		

* 1000 lb of finished product

INDUSTRY: Meat Products
SUBCATEGORY H: Ham Processor

2. MODEL PLANT ANALYSIS SUMMARY

	BPT			BAT			TOTAL		
Plant Flow (MGD)	Annual Cost Millions	Lbs BOD +O&G TSS Removed Millions	$/Lb.	Incremental Annual Cost Millions	Incremental Lbs BOD + O&G TSS Removed Millions	Incremental $/Lb.	Total Annual Cost Millions	Total Lbs BOD+ O&G TSS Removed Millions	Total $/Lb.
BPT .107 BAT .054	.003	.220	.02	.0	.007	.0	.003	.23	.01

INDUSTRY: Meat Products

SUBPART I: Canned Meats

I. Effluent Guidelines

Raw Waste Load			BPT Regulations 40 CFR 432.92 Promulgated: Jan 3, 1975 Amended:				BAT Regulations 40 CFR 432.93 Promulgated Jan 3, 1975 Amended:			
	lbs/u*	mg/l		lbs/u*	mg/l	% rem		lbs/u*	mg/l	% rem
BOD5	11.5	1022	BOD5	.37	33	96.8	BOD5	.17	30	98.5
TSS	4.54	404	TSS	.45	40	90.1	TSS	.22	39	95.2
Oil & Grease	2.08	185	Oil & Grease	.13	12	93.8	Oil & Grease	.13	24	93.8
Ammonia	74.25	6.6	Ammonia	No Limitation			Ammonia	0.022	4	99.9
			Fecal Coliform	Maximum at any one 400 MPN/100 ml			Fecal Coliform	Maximum at any one 400 MPN/100 ml		
			pH	Within the range of 6.0 - 9.0			pH	Within the range of		

* 1000 lb of finished product

INDUSTRY: Meat Products
SUBCATEGORY I: Canned Meats

2. MODEL PLANT ANALYSIS SUMMARY

	BPT			BAT			TOTAL		
Plant Flow (MGD)	Annual Cost Millions	Lbs BOD + O&G TSS Removed Millions	$/Lb.	Incremental Annual Cost Millions	Incremental Lbs BOD +O&G TSS Removed Millions	Incremental $/Lb.	Total Annual Cost Millions	Total Lbs BOD+ O&G TSS Removed Millions	Total $/Lb.
BPT 0.238 BAT 0.119	.005	.76	.01	.0	.023	.0	.005	.78	.01

INDUSTRY: Meat Products

SUBPART J: Renderers

I. Effluent Guidelines

Raw Waste Load			BPT Regulations 40 CFR 432.102 Promulgated: Jan. 3, 1975 Amended: March 14, 1975				BAT Regulations 40 CFR 432.103 Promulgated Jan 3, 1975 Amended: Sept. 29, 1977			
	lbs/u*	mg/l		lbs/u	mg/l	% rem		lbs/u	mg/l	% rem
BOD5	2.15	659	BOD5	.17	52	92.1	BOD5	.09	28	95.8
TSS	1.13	346	TSS	.21	64	81.4	TSS	.11	34	90.3
Oil & Grease	0.72	221	Oil & Grease	.10	31	86.1	Oil & Grease	.05	15	93.1
Ammonia	0.299	92	Ammonia	No Limitation			Ammonia	.07	21	76.6
			Fecal Coliform	Maximum at any one time 400 MPN/100 ml			Fecal Coliform	Maximum at any one time 400 MPN/100 ml		
			pH	Within the range of 6.0 - 9.0			pH	Within the range of 6.0 - 9.0		

1Additional discharge is allowed if hide curing is also performed at the plant

* 1000 lb of raw material

INDUSTRY: Meat Products
SUBCATEGORY J: Renderders

2. MODEL PLANT ANALYSIS SUMMARY

	BPT			BAT			TOTAL		
Plant Flow (MGD)	Annual Cost Millions	Lbs BOD + O&G TSS Removed Millions	$/Lb.	Incremental Annual Cost Millions	Incremental Lbs BOD +O&G TSS Removed Millions	Incremental $/Lb.	Total Annual Cost Millions	Total Lbs BOD + O&G TSS Removed Millions	Total $/Lb.
BPT and BAT 0.083	0.015	0.18	0.09	.0	0.012	.0	0.015	0.19	0.08

TAB C

COST ESTIMATES FOR MUNICIPAL TREATMENT SYSTEMS

The cost estimates and pollutant removal rates for determining the incremental cost of removal at a POTW are primarily drawn from three EPA references. These references generally present cost curves from which total annual costs can be estimated and tables indicating effluent concentrations achievable from various treatment systems. The purpose of this TAB is to present the tables and graphs from which the incremental costs of removal are estimated. The methodology and calculations by which the estimates are made are included in the Federal Register notice. The following figures are presented:

- "Areawide Assessment Procedures Manual, Appendix H," Office of Research and Development, EPA:

  Figure 1 - Development of Capital Costs: This figure indicates the cost components that must be added to the quantities obtained from the cost curves.

  Figure 2 - Treatment System Performance Matrix: This figure presents the effluent concentrations achievable by various treatment systems.

  Figure 3 - Treatment System 5 - Activated Sludge: This figure presents the equipment and operating and maintenance costs for an activated sludge system.

  Figure 4 - Treatment System 6 - Activated Sludge with Metal Salt Addition: This figure presents the equipment and operating and maintenance costs for a system designed to remove total phosphorus.

  Figure 5 - Treatment System 13 - Small Flow Treatment Systems: This figure presents the equipment and operating and maintenance costs for package treatment systems.

  Figure 6 - Facultative Lagoon (warm climate): This figure presents the equipment and operating and maintenance costs for facultative lagoons.

  Figure 7 - Miscellaneous Structures: This figure presents the construction cost and operating and maintenance cost for miscellaneous structures. Not all of the costs are applicable to small flow systems, so 50% of the costs were allocated for systems under 1 million gallons per day.

- "Technical Policy and Procedures 1978 Survey of Needs for Publicly Owned Wastewater Facilities," EPA:

  Figure 8 - Wastewater Treatment Costs: This figure presents the capital costs for several treatment systems.

- "An Analysis of Construction Cost Experience for Wastewater Treatment Plants," Municipal Construction Division, EPA:

  Figure 9 - Treatment Plant Construction Cost Curves - Smaller Flows: This figure presents the capital costs for several treatment systems.

  Figure 10- Treatment Plant Construction Cost Curves - Larger Flows: This figure presents the capital costs for several treatment systems.

TABLE H-2

DEVELOPMENT OF CAPITAL COSTS

Component Installed Construction Costs				
			$________	
(Unit processes specific to each Cost Estimate)			$________	
Misc. Structures (Figure H-29)*			$________	
Subtotal 1				$________
	Avg.	Range**		
Piping	10%	8-15%	$________	
Electrical	8%	5-12%	$________	
Instrumentation	5%	3-10%	$________	
Site Preparation	5%	1-10%	$________	
Subtotal 2				$________
Engineering and Construction -Supervision @ 15%	***		$________	
Contingencies @ 15%	***		$________	
TOTAL CAPITAL COST				$________

*Not to be included when municipal wastewater treatment system or wet weather treatment process curves are used. These include miscellaneous structures in their construction costs.

**Range due to level of complexity, degree of instrumentation, subsoil conditions, configuration of site, etc..

***Percentage of Subtotal 2.

TABLE II-3

TREATMENT SYSTEM PERFORMANCE MATRIX

System Number	Figure No	BOD_5	TSS	COD	Total P	NH3-N	NO3-N	UOD[1]	Description of System
		EFFLUENT CHARACTERISTICS							
-	-	210	230	400	11	20	0	406	Raw Waste Characteristics
1	II-2	130	100	250	9	20	0	286	Primary
2	II-3	100	50	185	2	20	0	241	Primary and Metal Salt Addition ($FeCl_3$)
3	II-4	45	60	90	8	18	0	150	Primary and Trickling Filter
4	II-5	25	30	50	2	18	0	120	Primary and Trickling Filter with Metal Salt ($FeCl_3$)
5	II-6	20	20	45	7	17	0	107	Primary and Activated Sludge
6	II-7	15	15	35	2	17	0	100	Primary, Activated Sludge, Metal Salt (Alum)
7	II-8	10	20	35	8	2	18	24	Primary, Activated Sludge/Nitrification
8	II-9	10	20	45	8	1	1	20	Primary, Activated Sludge, Nitrification, Denitrification
9	II-10	10	10	45	1	2	18	24	Primary Metal Salt Addition (Alum), Activated Sludge/Nitrification Filtration
10	II-11	5	5	25	1	20	0	99	Preliminary, Two-Stage Lime, Filtration, Carbon Adsorption
11	II-12	5	5	30	0.5	1	1	12	Primary Metal Salt Addition (Alum), Activated Sludge, Nitrification, Denitrification, Polymer, Filtration
12	II-13	3	5	10	0.5	1	1	12	Primary Metal Salt Addition (Alum), Activated Sludge, Nitrification-Denitrification, Polymer, Filtration, Carbon Adsorption
13	II-14	20	20	45	7	17[2] 2[3]	0	107	Small-Flow Treatment Systems, i.e., Package Plants - Extended Aeration Plant 0.01-0.1 mgd; contact stabilization plant 0.1-1.0 mgd.
14	II-15	15	15	46	6	1.0	8	27	Oxidation Ditch; 0.05-10 mgd (designed for nitrogen removal)
15	II-16	-	-	-	-	-	-	-	Land Application

Note: Treatment systems 1-12 include disinfection, sludge handling, miscellaneous structures, and support personnel. Treatment Systems 13-15 DO NOT include sludge dewatering, miscellaneous structures and support personnel.

[1]UOD = Ultimate Oxygen Demand = (1.5 x BOD_5) + (4.57 x NH_3-N)
[2]Contact Stabilization.
[3]Extended Aeration.

Figure 3

FIGURE H-6 TREATMENT SYSTEM 5-
ACTIVATED SLUDGE

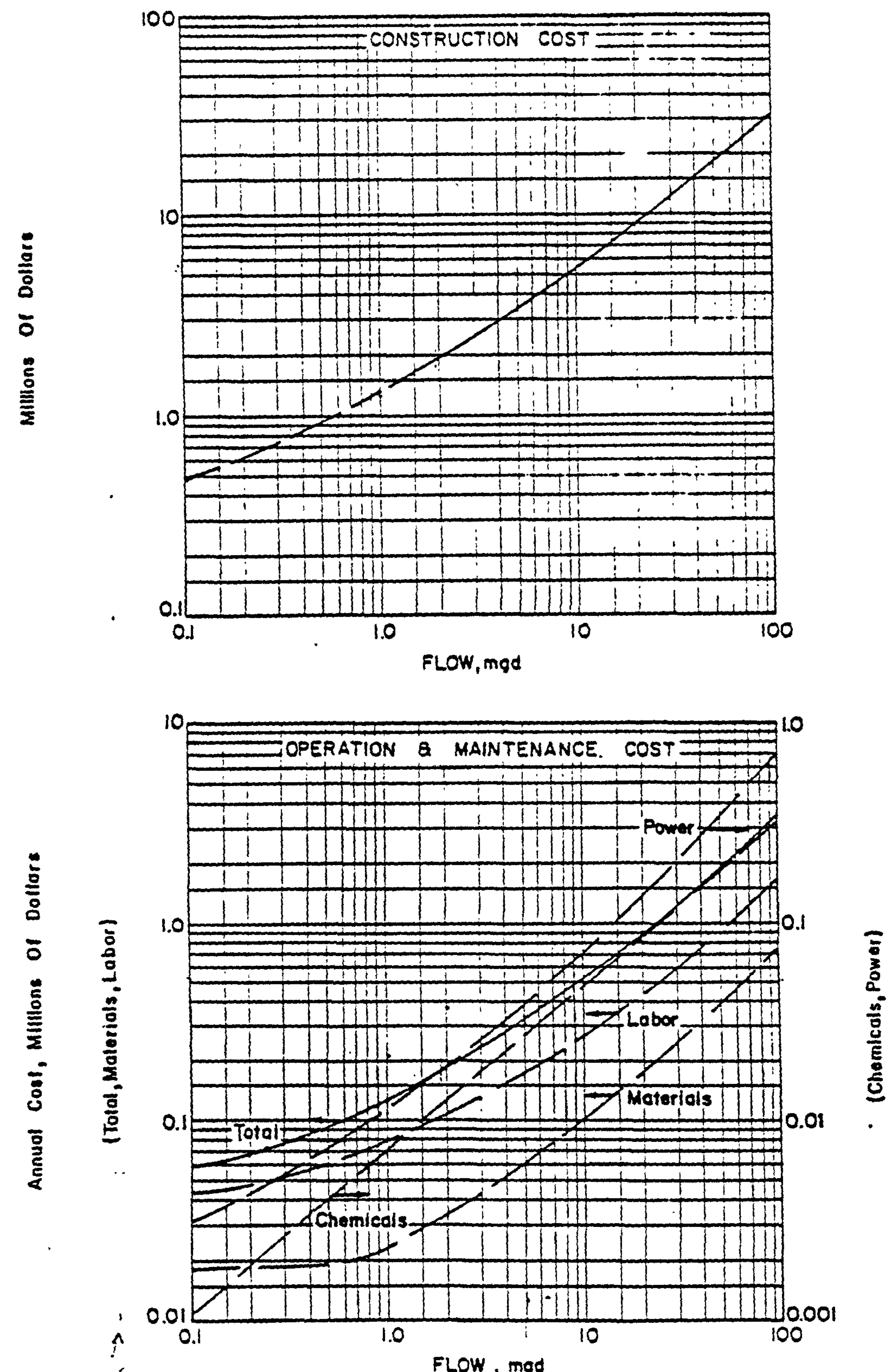


FIGURE H-7 TREATMENT SYSTEM 6 - ACTIVATED SLUDGE WITH METAL-SALT ADDITION (ALUM)

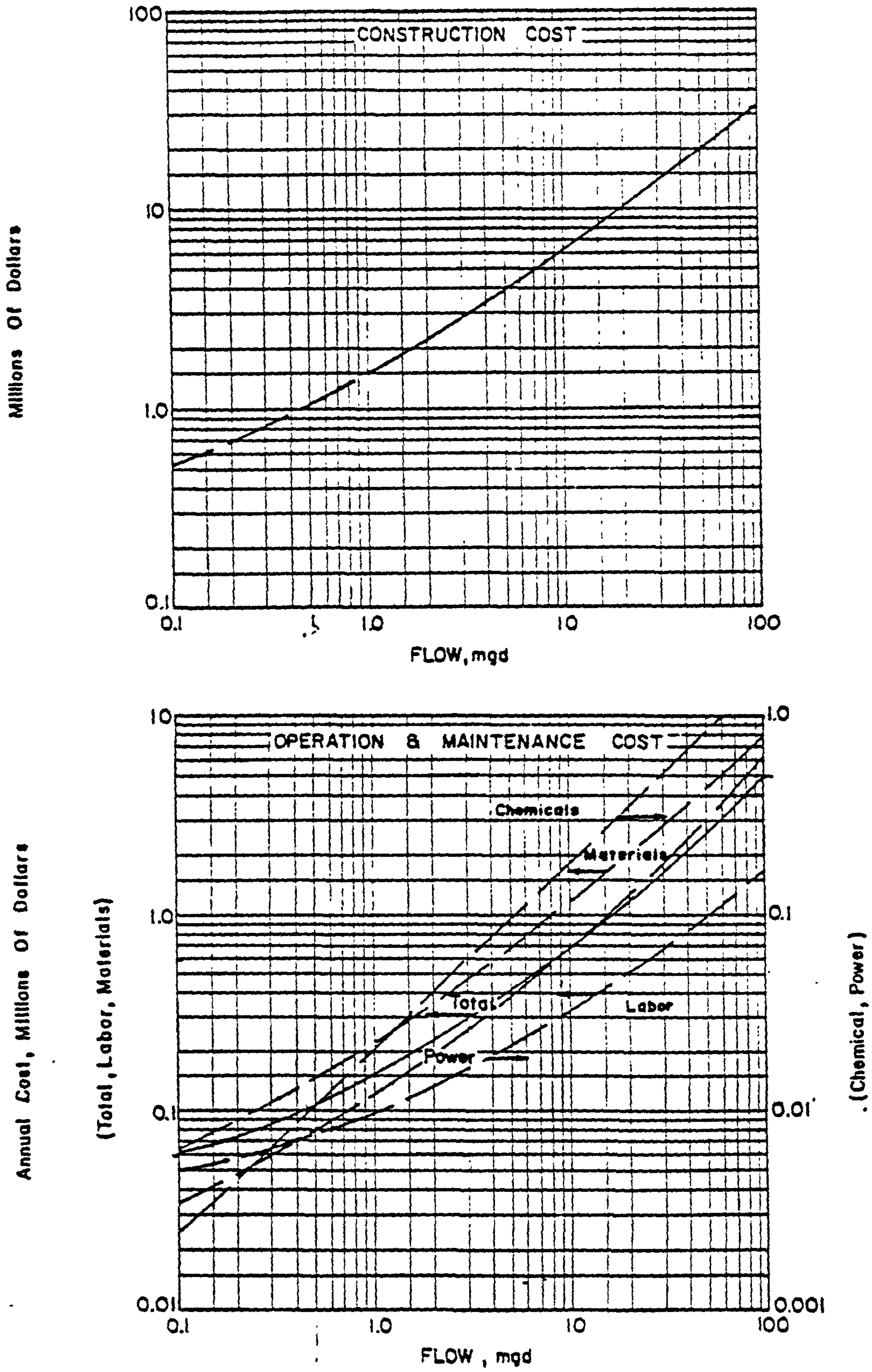
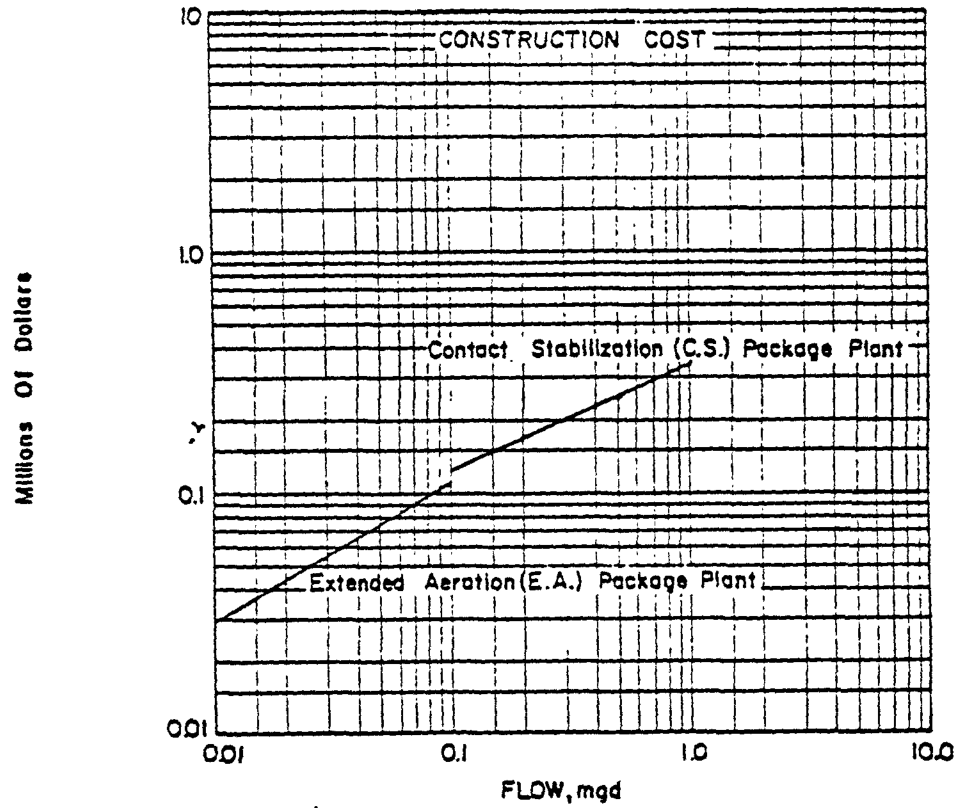


FIGURE H-14 TREATMENT SYSTEM 13-
SMALL FLOW TREATMENT SYSTEMS



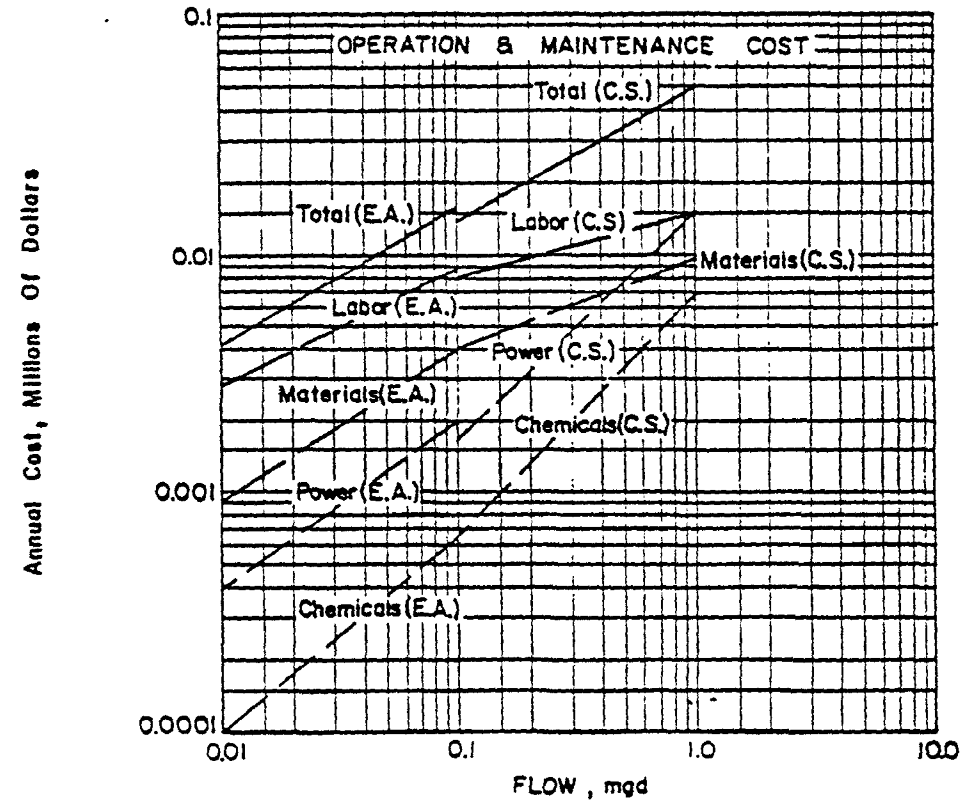


Figure 6

FIGURE H-40[1] FACULATIVE LAGOON (Warm Climates)

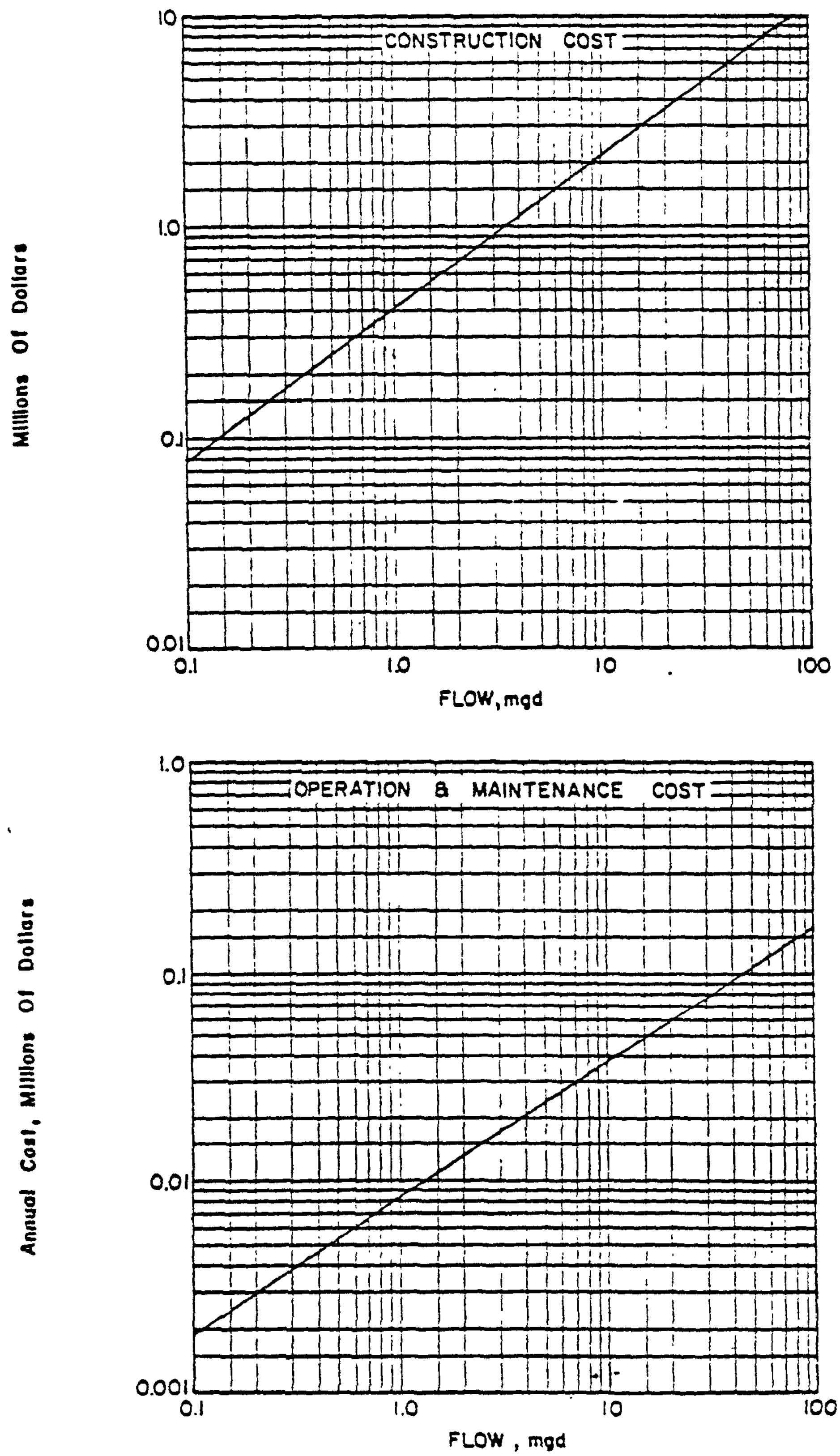


FIGURE H-29 MISCELLANEOUS STRUCTURES

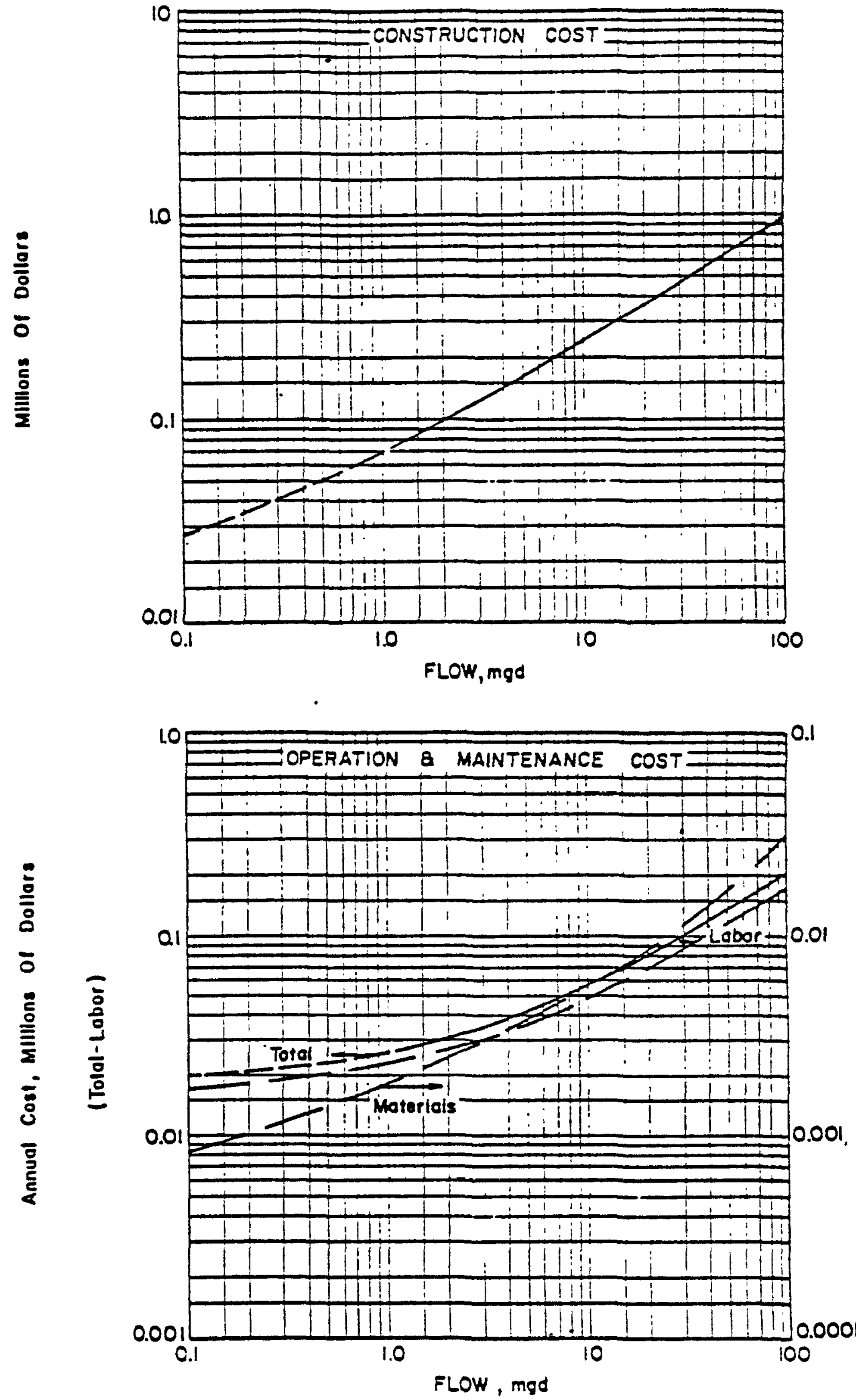


Figure 8

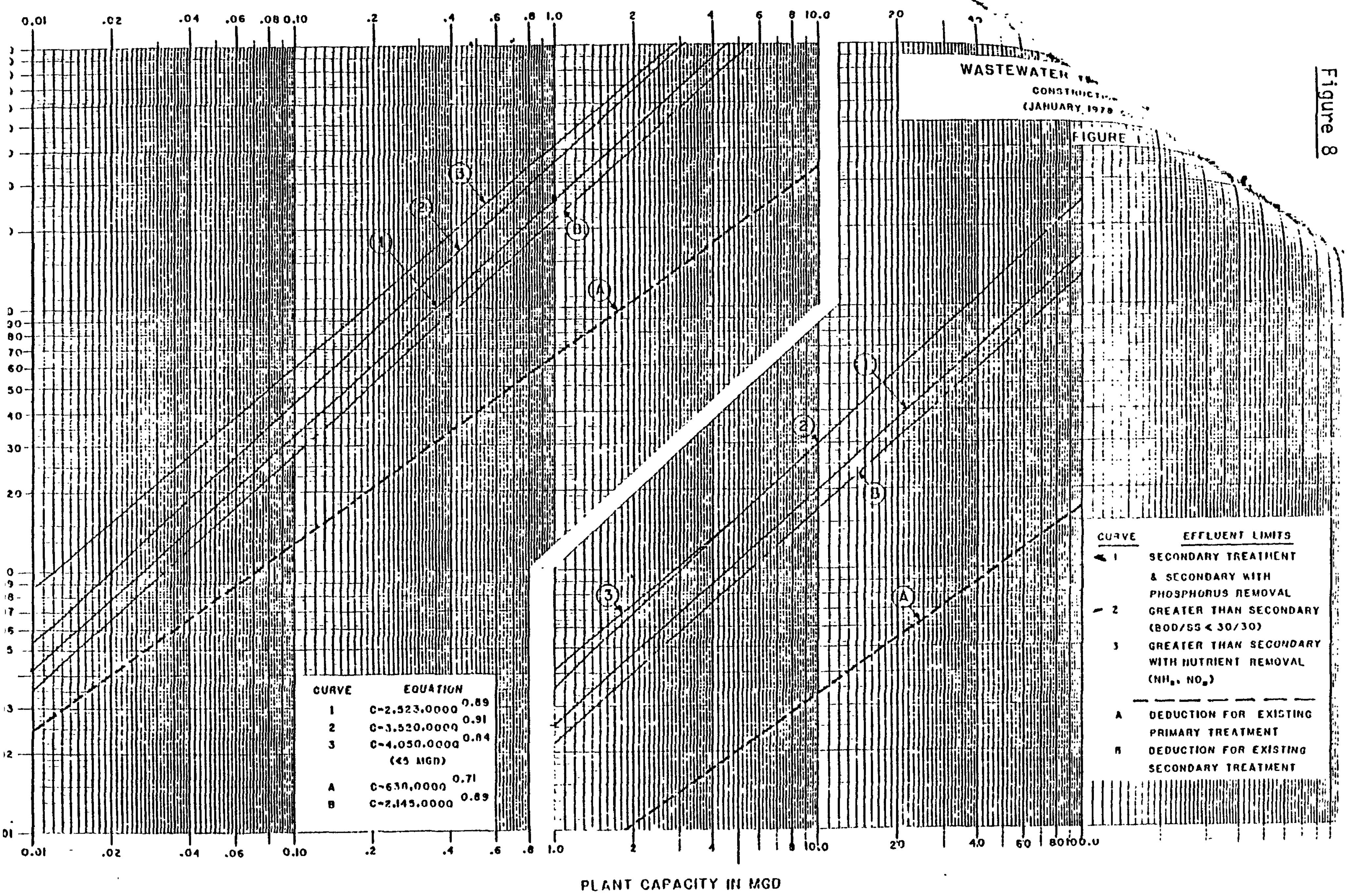
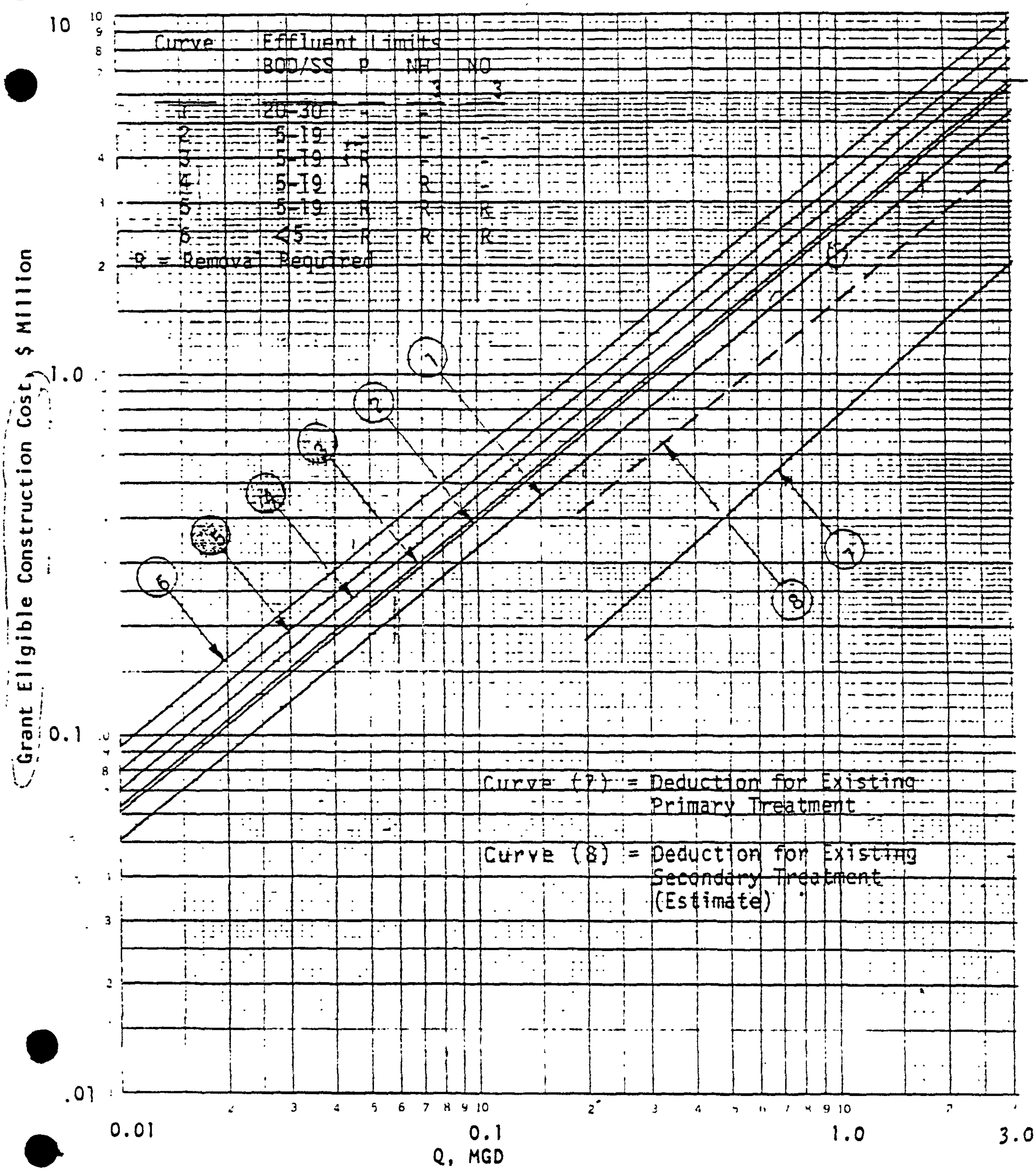

WASTEWATER
CONSTRUCTI
(JANUARY 1978
FIGURE
CURVE
EQUATION
1 C=2,523,000Q^0.89
2 C=3,520,000Q^0.91
3 C=4,050,000Q^0.84
(<5 MGD)
A C=630,000Q^0.71
B C=2,145,000Q^0.89
CURVE
EFFLUENT LIMITS
1 SECONDARY TREATMENT & SECONDARY WITH PHOSPHORUS REMOVAL
2 GREATER THAN SECONDARY (BOD/SS < 30/30)
3 GREATER THAN SECONDARY WITH NUTRIENT REMOVAL (NH3, NO3)
A DEDUCTION FOR EXISTING PRIMARY TREATMENT
B DEDUCTION FOR EXISTING SECONDARY TREATMENT
PLANT CAPACITY IN MGD

Figure 9

.EATMENT PLANT CONSTRUCTION COST CURVES - DESIGN FLOW RATE 0.01 to 3.0 MGD

(STP Index - 263)



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TREATMENT PLANT CONSTRUCTION COST CURVES - DESIGN FLOW RATE 3 TO 1000 MGD

(STP Index - 263)