ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 432

[FRL–7543–2]

RIN 2040–AD56

Effluent Limitations Guidelines and New Source Performance Standards for the Meat and Poultry Products Point Source Category; Notice of Data Availability

AGENCY: Environmental Protection Agency (EPA).

ACTION: Notice of data availability.

SUMMARY: On February 25, 2002 (67 FR 8582), EPA published a proposal to establish technology-based effluent limitations guidelines and standards for the meat and poultry products (MPP) point source category (formerly the meat product point source category). The proposal would apply to approximately 300 facilities that have wastewater discharges directly to surface waters from the operation of new and existing meat processing, poultry processing and independent rendering facilities. EPA developed the proposal to address changes in the meat processing industry over the last 30 years, and to include measures that reduce pollution from nutrients. Also, the proposal would establish national regulations for the poultry processing industry for the first time.

In the proposal, EPA specifically solicited comment on 20 issues. EPA received comments on these and other issues from various stakeholders, including State and local regulatory authorities, environmental groups, individual industrial facilities and industry groups, and private citizens. This notice of data availability presents a summary of data received in comments since the proposal and additional data collected by EPA and describes how these data may be used by EPA in developing final regulations.

EPA is evaluating how the comments and new data may change certain aspects of the regulatory analysis presented at proposal and how this information might affect the regulatory options considered for the proposal. This includes an evaluation of the underlying data and methodology used to estimate the costs, pollutant load reductions, and financial impacts associated with the proposed regulation in light of the comments and new information. This document describes EPA's current thinking on these subjects and presents information on how the new data and information received since proposal could affect the proposed limitations and standards. Today, EPA is making these data and new information available for public review and comment. The new data and analyses on non-small red meat and poultry slaughterhouses (the largest industry subcategories) are summarized and discussed in this notice. Due to time constraints in preparing the NODA the new costs and loadings for processing-only red meat and poultry facilities, independent rendering facilities, and small facilities are not presented in this document, but this information will be available in the public docket for public review at the time of the NODA publication. EPA solicits public comment on the issues and information presented in this notice of data availability and in the public docket supporting this document.

This document also serves to clarify the distinction between an MPP facility and a CAFO, and specifically discusses the possible changes to the MPP rule as a result of the clarification.

DATES: You must submit comments by September 29, 2003.

ADDRESSES: Public comments regarding this document should be mailed to Water Docket, Environmental Protection Agency, Mailcode 4101T, 1200 Pennsylvania Avenue, NW., Washington, DC 20460, Attention Docket ID No. OW–2002–0014, or submitted electronically at *http.epa.gov/edocket.* For additional information on how to submit comments see section B, ''**SUPPLEMENTARY INFORMATION,** How and To Whom Do I Submit Comments?''

FOR FURTHER INFORMATION CONTACT: For additional information, contact Ms. Samantha Lewis at (202) 566–1058 or at the following e-mail address: *lewis.samantha@epa.gov* or Ms. Shari Barash at (202) 566–0996 or at the following e-mail address: *barash.shari@epa.gov.*

SUPPLEMENTARY INFORMATION:

A. Regulated Entities

Entities potentially regulated by this action include:

Category	Examples of regulated entities	Primary SIC and NAICS codes
Industry	Facilities engaged in first processing, further processing, or rendering of meat and poultry products, which may include the following sectors:	
	Meat Packing Plant	2011 (SIC)
	Animal (except Poultry) Slaughtering	311611 (NAICS)
	Meat Processed from Carcasses	311612 (NAICS)
	Sausages and Other Prepared Meat Products	2013 (SIC)
	Poultry Slaughtering and Processing	2015 (SIC)
	Poultry Processing	311615 (NAICS)
	Rendering and Meat By-Product Processing	311613 (NAICS)
	Support Activities for Animal Production	11521 (NAICS)
	Prepared Feed and Feed Ingredients for Animals and Fowls, Except Dogs and Cats.	2048 (SIC)
	Dog and Cat Food	2047 (SIC)
	Dog and Cat Food Manufacturing	311111 (NAICS)
	Other Animal Food Manufacturing	311119 (NAICS)
	All Other Miscellaneous Food Manufacturing	311999 (NAICS)
	Animal and Marine Fats and Oils	2077 (SIC)
	Poultry Hatcheries	11234 (NAICS)
	Livestock Services, Except Veterinary	0751 (SIC)

The preceding table is not intended to be exhaustive, but rather provides a guide for readers regarding entities likely to be regulated by the proposed rule. This table lists the types of entities that EPA is now aware could potentially be regulated by promulgation of the proposed rule. Other types of entities not listed in the table could also be regulated. To determine whether your facility would be regulated by promulgation of the proposed rule, you

should carefully examine the applicability subsection of each proposed subpart of part 432. You should also examine the description of the proposed scope of each subpart in section VI.B of the proposed rule. If you have questions regarding the applicability of this proposed rule to a particular entity, please contact the person listed for technical information in the preceding **FOR FURTHER INFORMATION CONTACT** section.

B. How Can I Get Copies of This Document and Other Related Information?

1. *Docket.* EPA has established an official public docket for this action under Docket ID No. OW–2002–0014. The official public docket consists of the documents specifically referenced in this action, any public comments received, and other information related to this action. The official public docket is the collection of materials that is available for public viewing at the Water Docket in the EPA Docket Center, (EPA/DC) EPA West, Room B102, 1301 Constitution Ave., NW., Washington, DC. The EPA Docket Center Public Reading Room is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is (202) 566–1744, and the telephone number for the Water Docket is (202) 566–2426. For access to docket materials, please call ahead to schedule an appointment. Every user is entitled to copy 266 pages per day before incurring a charge. The Docket may charge 15 cents a page for each page over the page limit plus an administrative fee of $25.

2. *Electronic Access.* You may access this **Federal Register** document electronically through the EPA Internet under the ''**Federal Register**'' listings at *http://www.epa.gov/fedrgstr/.*

An electronic version of the public docket is available through EPA's electronic public docket and comment system, EPA Dockets. You may use EPA Dockets at *http://www.epa.gov/edocket/* to submit or view public comments, access the index listing of the contents of the official public docket, and to access those documents in the public docket that are available electronically. Once in the system, select ''search,'' then key in the appropriate docket identification number.

Certain types of information will not be placed in the EPA Dockets. Information claimed as confidential business information (CBI) and other information whose disclosure is restricted by statute, which is not included in the official public docket, will not be available for public viewing in EPA's electronic public docket. EPA's policy is that copyrighted material will not be placed in EPA's electronic public docket but will be available only in printed, paper form in the official public docket. To the extent feasible, publicly available docket materials will be made available in EPA's electronic public docket. When a document is selected from the index list in EPA Dockets, the system will identify whether the document is available for viewing in EPA's electronic public docket. Although not all docket materials may be available electronically, you may still access any of the publicly available docket materials through the docket facility identified in section B.1. EPA intends to work towards providing electronic access to all of the publicly available docket materials through EPA's electronic public docket.

For public commenters, it is important to note that EPA's policy is that public comments, whether submitted electronically or in paper, will be made available for public viewing in EPA's electronic public docket as EPA receives them and without change, unless the comment contains copyrighted material, CBI, or other information whose disclosure is restricted by statute. When EPA identifies a comment containing copyrighted material, EPA will provide a reference to that material in the version of the comment that is placed in EPA's electronic public docket. The entire printed comment, including the copyrighted material, will be available in the public docket.

Public comments submitted on computer disks that are mailed or delivered to the docket will be transferred to EPA's electronic public docket. Public comments that are mailed or delivered to the Docket will be scanned and placed in EPA's electronic public docket. Where practical, physical objects will be photographed, and the photograph will be placed in EPA's electronic public docket along with a brief description written by the docket staff.

For additional information about EPA's electronic public docket visit EPA Dockets online or *see* 67 FR 38102, May 31, 2002.

C. How and To Whom Do I Submit Comments?

You may submit comments electronically, by mail, or through hand delivery/courier. To ensure proper receipt by EPA, identify the appropriate docket identification number in the subject line on the first page of your comment. Please ensure that your comments are submitted within the specified comment period. Comments received after the close of the comment period will be marked ''late.'' EPA is not required to consider these late comments. If you wish to submit CBI or information that is otherwise protected by statute, please follow the instructions in section D. Do not use EPA Dockets or e-mail to submit CBI or information protected by statute.

1. *Electronically.* If you submit an electronic comment as prescribed below, EPA recommends that you include your name, mailing address, and an e-mail address or other contact information in the body of your comment. Also include this contact information on the outside of any disk or CD-ROM you submit, and in any cover letter accompanying the disk or CD-ROM. This ensures that you can be identified as the submitter of the comment and allows EPA to contact you in case EPA cannot read your comment due to technical difficulties or needs further information on the substance of your comment. EPA's policy is that EPA will not edit your comment, and any identifying or contact information provided in the body of a comment will be included as part of the comment that is placed in the official public docket, and made available in EPA's electronic public docket. If EPA cannot read your comment due to technical difficulties and cannot contact you for clarification, EPA may not be able to consider your comment.

i. *EPA Dockets.* Your use of EPA's electronic public docket to submit comments to EPA electronically is EPA's preferred method for receiving comments. Go directly to EPA Dockets at *http://www.epa.gov/edocket,* and follow the online instructions for submitting comments. To access EPA's electronic public docket from the EPA Internet Home Page, select ''Information Sources,'' ''Dockets,'' and ''EPA Dockets.'' Once in the system, select ''search,'' and then key in Docket ID No. OW–2002–0014. The system is an ''anonymous access'' system, which means EPA will not know your identity, e-mail address, or other contact information unless you provide it in the body of your comment.

ii. *E-mail.* Comments may be sent by electronic mail (e-mail) to *OW-Docket@epa.gov,* Attention Docket ID No.OW–2002–0014. In contrast to EPA's electronic public docket, EPA's e-mail system is not an ''anonymous access'' system. If you send an e-mail comment directly to the Docket without going through EPA's electronic public docket, EPA's e-mail system automatically captures your e-mail address. E-mail

addresses that are automatically captured by EPA's e-mail system are included as part of the comment that is placed in the official public docket, and made available in EPA's electronic public docket.

iii. *Disk or CD–ROM.* You may submit comments on a disk or CD–ROM that you mail to the mailing address identified in section C.2. These electronic submissions will be accepted in Word Perfect, Microsoft Word, or ASCII file format. Avoid the use of special characters and any form of encryption.

2. *By Mail.* Send an original and three (3) copies of your comments and enclosures as well as any references cited in your comments to Water Docket, Environmental Protection Agency, Mailcode: 4101T, 1200 Pennsylvania Avenue, NW., Washington, DC 20460, Attention Docket ID No. OW–2002–0014.

3. *By Hand Delivery or Courier.* Deliver your comments to Water Docket, EPA Docket Center, EPA West, Room B102, 1301 Constitution Avenue, NW., Washington, DC, Attention Docket ID No. OW–2002–0014. Such deliveries are only accepted during the Docket's normal hours of operation, as identified in section B.1.

D. How Should I Submit CBI to the Agency?

Do not submit information that you consider to be CBI electronically through EPA's electronic public docket or by e-mail. Send information identified as CBI by mail only to the following address: Engineering & Analysis Division, Mail Code 4303T, U.S. Environmental Protection Agency, 1200 Pennsylvania Ave., NW., Washington, DC 20460, Attention: Samantha Lewis, Docket ID No. OW–2002–0014.

You may claim information that you submit to EPA as CBI by marking any part or all of that information as CBI (if you submit CBI on disk or CD–ROM, mark the outside of the disk or CD–ROM as CBI and then identify electronically within the disk or CD–ROM the specific information that is CBI). Information so marked will not be disclosed except in accordance with procedures set forth in 40 CFR part 2.

In addition to one complete version of the comment that includes any information claimed as CBI, a copy of the comment that does not contain the information claimed as CBI must be submitted for inclusion in the public docket and EPA's electronic public docket. If you submit the copy that does not contain CBI on disk or CD–ROM, mark the outside of the disk or CD–ROM clearly that it does not contain CBI. Information not marked as CBI will be included in the public docket and EPA's electronic public docket without prior notice. If you have any questions about CBI or the procedures for claiming CBI, please consult one of the people identified in the **FOR FURTHER INFORMATION CONTACT** section.

E. What Should I Consider as I Prepare My Comments for EPA?

You may find the following suggestions helpful for preparing your comments:

1. Explain your views as clearly as possible.

2. Describe any assumptions that you used.

3. Provide any technical information and/or data you used that support your views.

4. If you estimate potential burden or costs, explain how you arrived at your estimate.

5. Provide specific examples to illustrate your concerns.

6. Offer alternatives.

7. Make sure to submit your comments by the comment period deadline identified.

8. To ensure proper receipt by EPA, identify the appropriate docket identification number in the subject line on the first page of your response. It would also be helpful if you provided the name, date, and **Federal Register** citation related to your comments.

Contents of This Document

I. Purpose of This Document

Today's document has several purposes. First, EPA is presenting a summary of new data and information submitted during the public comment period on the proposed MPP regulations as well as data collected by EPA since proposal. Second, EPA discusses major issues raised in comments on the proposal and revisions in the data analyses resulting from these comments and the additional data. Third, the document summarizes EPA's current thinking on how this new information and suggestions made by commenters affect the analyses of the proposed rule. The document also summarizes several changes from the proposed regulatory requirements that EPA is considering for the final rule in light of the new material. The document includes revised target effluent concentrations for each model technology that incorporate post-proposal data collections and submissions that EPA used for developing revised compliance cost and pollutant loading reduction estimates.

Finally, the document discusses how incorporation of the new data and information would affect the cost and removals estimates associated with various treatment options.

Since proposal, EPA has incorporated a significant amount of additional technical and economic data (from fully analyzing all of the previously collected industry survey information as well as newly submitted/collected data) into the database used for developing the proposed MPP effluent limitations and standards. New data that EPA has used in the revised cost and economic models discussed in this NODA include data from screener surveys and detailed surveys that were not received in time to be incorporated into the analysis for the proposal and data from EPA and industry wastewater sampling of MPP raw wastewater, influent to treatment and wastewater effluent. In addition, EPA has modified certain assumptions used in its cost and pollutant loadings models. The new analyses presented in this NODA provide EPA's current thinking on how the analyses of regulatory options for the final rule may change as a result of the additional information obtained.

For a number of the subcategories proposed for regulation, these modifications have resulted in changes in the estimated cost and pollutant removals associated with the treatment options considered at proposal. As a consequence, the estimated economic impacts and cost effectiveness of the treatment options have changed as well. In light of these new results, EPA is seeking further comment on the regulatory options considered for the proposal as well as several modifications to these options that are based in part on new information regarding technology in place in the industry.

Through this notice of data availability, EPA seeks further public comment on any and all aspects of the specific data and issues it has identified here. However, EPA is seeking public comment *only* on these specific data and issues. Nothing in today's document is intended to invite further discussion of other issues discussed in the MPP proposal or to reopen the proposal in general for additional public comments. EPA continues to review the comments already submitted on the proposed rule and will address those comments, along with comments submitted on the data and issues identified in today's document, in the final rulemaking.

II. New Analytical Data and Complete Survey Data

There are five general areas of new analytical data and information: (1) EPA post-proposal sampling, (2) discharge monitoring report (DMR) data, (3) information from EPA Regional offices and States, (4) data submitted by industry, and (5) incorporation of all surveys and additional survey follow-up. EPA has incorporated much of this data into its analyses for this NODA. However, some data has not been included in the new analyses. As discussed elsewhere, analyses for non-small meat and poultry slaughterhouses are presented in this notice while analyses for further processors, renderers and small slaughterers are presented in the rulemaking docket. EPA has placed this data in the docket and although it has not incorporated the information into its analyses for the NODA, the Agency intends to use it for the final rule as appropriate. The detailed discussion below indicates which data have been incorporated into the NODA analysis at this juncture and which have not. Sections II.A–E discuss each of the five areas in more detail.

A. Post-Proposal Analytical Wastewater Sampling Data

In response to public comments, EPA has performed a number of analytical wastewater sampling episodes since the publication of the proposed rule to collect additional data on raw wastewater loadings, treatment efficiencies, and treatment variability for certain treatment options. EPA also performed a holding time study for the bacterial pollutant parameters (*e.g.* fecal coliforms).

1. EPA Site Visits and Sampling Episodes

During the comment period and at the public meetings on the proposal, commenters raised concerns over the representativeness of EPA's database for certain types of MPP facilities and whether the treatment systems at facilities sampled as ''BPT'' (Best Practicable Technology) or ''BAT'' (Best Available Technology) were accurately represented in the cost model. Based on these concerns, EPA worked with a coalition of industry representatives to identify types of facilities in these groups that would be good candidates for EPA's post-proposal wastewater sampling program. EPA then selected two poultry facilities identified by EPA regional personnel as being good sampling candidates and performed a pre-sampling site visit at each. During the poultry site visits EPA collected detailed information on the sampling logistics, production schedules, and processes the treatment systems employed. This information allowed EPA to determine whether the site was employing technology considered to be ''Best Available Technology.'' Based on this information, EPA selected one poultry facility for analytical wastewater sampling. This facility performs first processing, further processing and rendering. EPA has incorporated data from this sampling episode into the analyses presented in today's notice.

In addition, based on comments concerning facility operations and analytical results during the pre-proposal sampling episodes, EPA also decided to conduct an additional sampling episode at two of the six red meat facilities that were sampled prior to proposal. In response to comments regarding background levels of metals and other pollutants, EPA collected source water samples during each post-proposal sampling episode. EPA collected characterization samples of wastewater from production operations and paired influent and effluent samples from these facilities' treatment systems over five days. EPA notes that it did not use the earlier data from the pre-proposal sampling episodes at these two facilities in the analyses presented in today's notice, due to certain data quality issues. However, following completion of an evaluation of these issues, EPA may use these episodes along with the post-proposal sampling data, for the analyses supporting the final rule (*see* Section VIII for discussion of these data issues and solicitation of comment).

In addition, EPA conducted a post-proposal site visit to a poultry further processing facility (*i.e.*, a poultry processing facility where first processing and rendering are not performed on-site) that it had not sampled previously and obtained grab samples to characterize treatment system influent (*i.e.*, raw influent prior to preliminary treatment steps) and effluent wastewater. EPA has incorporated the results from this episode into its revised analysis of poultry further processing facilities. Analyses for further processors can be found in Section 21.1, DCNs 125606 and 126002 of the public record.

EPA also sampled for Ultimate BOD at one red meat and one poultry facility. The results of the Ultimate BOD analysis have not been incorporated in the analyses for the NODA (*See* Section V.D for a discussion on the issues associated with use of these data). Non-confidential versions of all new Site Visit Reports (SVRs) and Sampling

Episode Reports (SERs) can be found in Section 19.1.4.2 the public record for this notice.

EPA previously indicated that it would sample at an independent renderer after proposal (see 67 FR 8606). However, EPA subsequently decided that other data sources provided adequate information and instead evaluated information on three independent renderers provided by the industry. This information included data on the size of each facility, the wastewater treatment in-place and the wastewater characteristics of the influent to the treatment system and treated effluent. Two of the three facilities also provided data collected from wastewater sampled at intermediate points in the wastewater treatment system. In EPA's view, this data combined with (or evaluated in comparison with) data from sampling which included rendering wastewater (*e.g.*, data from a facility that performs slaughtering, further processing, and rendering) provide an appropriate basis for evaluating the baseline loadings and treatment-in-place at rendering facilities. EPA has used this data in the NODA analysis for developing default baseline concentrations and assessing treatment-in-place for facilities in Subcategory J (Independent Renderers). EPA's estimates of costs and pollutant loadings for Subcategory J are presented in Section 21.1, DCNs 125606 and 126002 of the public record.

2. Holding Time Study

When EPA conducted its own sampling episodes at the facilities, it exceeded the required holding time for some samples. While laboratories qualified to conduct total coliforms, fecal coliforms, and *E. coli* analyses may have been within driving distance of the facilities being evaluated, laboratories qualified to perform fecal streptococcus, *Salmonella,* and *Aeromonas* analyses generally were not available, as analysis for these analytes is more complex than coliforms analyses. As a result, for most sampling episodes, EPA decided samples should be shipped overnight to a laboratory capable of performing all of the bacterial analyses. Because these samples would exceed the holding time requirements in 40 CFR part 136, EPA performed a holding time study to evaluate the possible effects of analyzing samples at different holding times.

To determine if results for samples with longer holding times were consistent with results for samples analyzed within eight hours (*i.e.*, the time period consistent with 40 CFR part 136 for compliance sampling) for total coliforms, fecal coliforms, *E. coli, Aeromonas,* fecal streptococcus, and *[Salmonella* from MPP facilities, EPA conducted a study to evaluate sample concentrations at 8, 24, 30, and 48 hours after sample collection for wastewater effluent samples from a beef facility (before disinfection and final effluent), a pork facility (final effluent prior to discharge into the sewer system), and a poultry facility (final effluent). The study report which contains results for all target bacteria is located at DCN 165311 in Section 22.6 in the public record for this NODA. This NODA discusses only the results for fecal coliforms and *E. coli* as EPA is not intending to establish numeric limitations for other target indicators in the holding time study. As holding times increase, the fecal coliforms and *E. coli* concentrations may change. EPA's intent in conducting the study was to provide some insights about the length of time that would still provide comparable results to samples held for eight hours.

For red meat (*e.g.*, beef and pork) effluent, the results of this study indicate that samples for fecal coliforms and *E. coli* measurements can be held for 24 hours and still produce results comparable to analyses conducted at 8 hours after sample collection, provided that samples are stored on ice until analysis and not frozen. For poultry wastewater effluent, the study results indicate that samples held longer than the 8 hours do not provide comparable results to results at 8 hour holding times.

B. Discharge Monitoring Report Data

As discussed further in Sections III and VIII, EPA is considering the use of discharge monitoring report (DMR) data, and the supporting daily or weekly measurements, to evaluate and revise as necessary the proposed MPP limitations and standards (Section VIII) and compliance cost and loadings estimates for various technology options for the final rule (Section III). EPA used the summary DMR data from detailed survey recipients and PCS to supplement its sampling data in the development of pollutant loading and reduction estimates presented in today's notice. EPA has also incorporated daily/weekly DMR supporting data from 16 facilities in the slaughtering subcategories (A–D and K) into the revised facility-level long-term averages and variability factors, see DCN 165080 and DCN 165160.

EPA obtained summary DMR data, where available, from: (1) EPA's permit compliance system (PCS) for survey facilities (both detail survey sites and screener survey sites), (2) EPA Regional offices for some screener survey sites, detailed survey sites, and facilities identified in PCS as performing meat or poultry processing operations (see Section II.C below), and (3) individual further processor screener survey sites based on discussions during survey follow-up (see Section II.E for additional discussion on survey follow-up). EPA also requested detailed DMR data from 24 facilities in the slaughtering subcategories (Subcategories A–D and K) as discussed below.

Following proposal, based on the DMR summary data provided in the detailed surveys or PCS, EPA requested individual data points (*e.g.*, daily or weekly measurements) from 24 detailed survey sites in Subcategories A–D and K for use in evaluating and revising the limitations and standards and supporting analyses (See Sections III.B and VIII.D of today's notice for more information on how EPA is considering using the DMR data). To date, EPA has received complete data from16 facilities, partial data from 5 facilities, and no data from 3 facilities. EPA has placed all data received to date in the public record (Section 19.3.3) and will include any additional data as it is received. EPA intends to incorporate all appropriate data from this request into the analyses for the final rule including target effluent concentrations used for estimating compliance costs and pollutant load reductions and for developing or evaluating the long-term averages and variability factors for the final limitations. For this notice, EPA has incorporated the 16 complete daily/weekly data sets into its development of facility-level (episode-level) long-term averages and variability factors (see DCNs 165080 and 165160), but not into the revised analyses of costs and loadings. Summary DMR data has been used in the revised cost and loading estimates however.

C. Information From EPA Regions and States

1. Permits, Permit Applications and Fact Sheets

In an effort to obtain additional information without burdening the facilities directly, EPA gathered permits, permit applications and permit fact sheets from EPA Regional offices and States for some facilities from which EPA did not receive a detailed survey and which were identified as meat or poultry processors either in EPA's Permit Compliance System (PCS) or in the screener survey database. PCS is a database which contains monitoring and NPDES permit data from major and

some minor point sources which discharge wastewater directly to surface water.

EPA was interested in obtaining information on the permit requirements and treatment-in-place at facilities which had specific production processes about which we had limited information for the proposal (*e.g.* stand-alone further processors and renderers.) EPA identified over 980 facilities in PCS that were classified under SIC codes 2011, 2013, 2015 and 2077 (the codes which identify meat or poultry processing and rendering), plus some related codes referring to different aspects of food processing such as 2091 (Canned and Cured Fish and Seafoods) and 2099 (Food Preparations, Not Elsewhere Classified). EPA then refined the list by selecting those facilities that had data in PCS for at least one of the following pollutant parameters: TKN, nitrate + nitrite, total phosphorus, chemical oxygen demand (COD), carbonaceous biochemical oxygen demand (CBOD), total nitrogen, fecal streptococci, total dissolved solids (TDS), chloride, *E. coli,* oil and grease as hexane extractable material (O&G as HEM), copper, chromium, nickel, and zinc. EPA then added to the list all further processors and independent renderer that were in the screener survey database, but were not currently on the list generated through PCS. Detailed survey recipients were then excluded because they provided sufficient information in their survey responses. EPA then sought permits for all the facilities identified on this refined list, which is included in the record (*see* DCN 100769).

EPA obtained a copy of the permit, permit application and/or fact sheet for 61 facilities (in 20 states) of 104 total facilities (in 27 states) on the refined list and obtained notice of closure on an additional 14 of the 104 facilities. However, EPA intends to include this information in its analyses for the final rule as appropriate. This information will provide EPA with descriptive information on additional MPP facilities which, when combined with the monitoring data contained in PCS, may help EPA to further evaluate the baseline level of wastewater treatment currently practiced by the industry.

More specifically, EPA is considering using this data to fill data gaps in the information used in EPA's estimates of baseline pollutant loadings for certain types of facilities (*e.g.*, further processors and independent renderers) and for developing the option-specific target effluent concentrations (*i.e.*, long-term averages) used for estimating compliance costs and pollutant reductions for these facilities for the final rule. For these classes of facilities, EPA would use the permit, fact sheet and permit application to expand the information regarding production practices and wastewater treatment currently in-place to better assess the baseline performance of these facilities and costs to comply with the regulatory options considered. *See* Section 21.1, DCNs 125606 and 126002 of the public record for EPA's estimates of costs and pollutant reductions for further processors and renderers. These estimates do include these additional data.

EPA may also use the data from PCS to assess the achievability of the limitations for these types of facilities in the final rule. EPA notes that because PCS does not generally contain the weekly/daily individual data points, EPA intends, at this time, to rely on other more detailed data to develop limitations and standards for these types facilities.

2. Summary of POTW Interferences and Upsets

As discussed in the proposal (67 FR 8637), EPA worked with its Regional offices and state pretreatment coordinators to collect additional data to determine whether or not national categorical pretreatment standards are necessary for the MPP industry. EPA did not propose to establish pretreatment standards for existing or new facilities in the MPP industry.

For each Region, EPA listed the indirect discharging screener survey facilities and corresponding POTWs according to the survey response. EPA requested the Regional Pretreatment Coordinators to verify that the screener survey MPP site had correctly identified the receiving POTW. EPA also asked the coordinators to identify any instances of interference or upsets that were attributed to the listed MPP site. The majority of MPP indirect dischargers are located in EPA Region 5 (Illinois, Ohio, Indiana, Michigan, Minnesota, and Wisconsin) and the majority of responses from this request were also from Region 5. There were very few reported instances of interference or upset from MPP facilities. One state pretreatment coordinator noted that in many cases MPP facilities pay a surcharge to the POTW to discharge higher than normal strength wastewater. In California, the state with the largest number of indirect discharge MPP sites, only two instances of POTW problems were identified as related to MPP discharges. Although it did not identify any specific instances of problems, the State of Oklahoma indicated its belief that not all POTWs can handle the conventional pollutant loadings from MPP facilities. For this reason and because of the lack of information available to establish local limits, the State supported the promulgation of pretreatment standards for MPP facilities that discharge to POTWs.

At this time, EPA does not consider this Regional/State information to be sufficient evidence that pretreatment standards are necessary for the MPP industry. For further discussion and to review the data listing and responses described above, *see* DCN 115077 in the public record for today's notice.

D. Data Submitted by Industry

In addition, EPA received some estimated summary-level cost data in the industry comments on what it may cost for a red meat and a rendering facility to upgrade their existing technologies. Also, several facilities submitted cost data as part of their detailed survey that provided estimated costs specific to installation or upgrade of each facility's wastewater treatment system. EPA also obtained upgrade/retrofit cost information from one red meat site and one poultry products site as a follow-up to earlier, pre-proposal sampling and from one poultry site that was sampled post-proposal. EPA has used this information in the development of the revised cost estimates presented in today's notice.

EPA has also received comment from industry representatives on components of its revised costing methodology during meetings with stakeholders. These comments and EPA's response, including a summary of changes made to the cost models as a result, can be found in the public record supporting this NODA (*see* DCN 115078). Non-confidential cost information can be found in Section 19.5 of the public record.

In general, these industry commenters believed that EPA had substantially underestimated the costs of achieving the proposed limits, in part because they believed additional treatment steps and/or capacity would be needed to reliably and consistently comply with these limits. Among the most significant issues raised were the sizing of the aerobic tanks, the need for a supplemental carbon source to maintain an adequate BOD to TKN ratio in the influent to the aerobic treatment stage, the costs for by-passing a portion of the treatment stream around the anaerobic lagoon to maintain sufficient BOD for denitrification, the level of nitrate/nitrite (as nitrogen) reduction achievable in the anoxic tank and the degree of comparability between poultry

and red meat facilities with respect to raw wastewater nitrogen concentrations, the level of cost savings attributable to reduced chemical additions for alkalinity, the cost and required dosage for polymer additions, the need for final holding lagoon to achieve consistent compliance, the practicality of achieving a 10 times recycle rate in the anoxic tank, and the incremental labor necessary to operate the treatment system.

Using revised assumptions that they believed were more realistic, these commenters estimated costs for 9 sample facilities that ranged from 4 to 8 times the cost estimates projected by EPA for these same facilities. EPA is still reviewing the revised assumptions used by these commenters, but preliminarily believes that some of them may be overly conservative and thus tend to overstate costs. EPA solicits comment and especially real-world data from plants operating the various technology options under consideration for the final rule to aid in determining realistic parameter estimates and assumptions for its cost models.

EPA received limited wastewater sampling data for seven specific facilities in response to its request in the proposed rule. These data were submitted by two individual facilities, two companies, one provided site-specific data for four facilities and one provided generalized data for its facilities, an industry coalition, and an industry trade association. The data submitted by the industry coalition and the industry trade association were the same, and represented data for four pollutants for one of the poultry facilities sampled by EPA for the proposal. This data has not been incorporated into the analyses for today's notice. Of the seven facilities for which data were submitted, data for two of the facilities was the same as the data provided in the facilities' detailed surveys (this data was provided only for TKN). EPA included this data in the loadings and cost analyses in today's notice. EPA did not use data from the remaining facilities for its analyses for today's notice because EPA requires supporting information about the facilities (*e.g.*, treatment system type, production type) before the data can be used in order to classify the data properly. Once the supporting information is submitted by the facilities, EPA anticipates that it will be able to use this data for the final rule. EPA did not incorporate the data submitted by the remaining company because it only supplied a typical range of TKN values for a number of its poultry facilities, and not for any specific facility. EPA has since requested facility-specific data from this commenter for each of its facilities (*see* Section II.B regarding DMR data requests).

E. Incorporation of All Surveys and Additional Survey Follow-Up

As discussed in the preamble to the proposed rule (67 FR 8593), EPA was not able to incorporate data from all complete survey responses prior to publication. In the proposal, EPA stated that it would use information from all screener and detailed surveys, including those collected after the cut-off dates (April 24, 2001 and May 29, 2001, respectively), in the analyses presented in this Notice of Data Availability. For the proposal, EPA was able to include information from 961 of 1500 screener survey responses and some of the information from 241 of 328 detailed survey responses. EPA notes that not all surveys returned to EPA provide complete information (even with EPA follow-up). For today's notice, EPA is using responses from 1,254 screener surveys and 328 detailed surveys. EPA notes that the analyses presented in today's notice focus on the 53 (of 328) detailed survey recipients who are non-small meat and poultry slaughterhouses discharging directly to surface waters. However, EPA included all the usable screener surveys and detailed surveys in its calculation of survey weights for developing national estimates (see Section III.B.3 for a discussion of survey weights). EPA has also analyzed detailed survey data from 5 additional direct dischargers which include three small facilities (two poultry facilities and one red meat facility), one poultry further processing facility, and one facility that only performs rendering operations. EPA has included data from these facilities in its analyses for small slaughterhouses, further processors, and renderers in Section 21.1 of the docket and intends to use the data from these facilities in developing the final rule. See Section X, for a discussion of EPA's revised estimates of compliance costs, pollutant reductions and economic impacts.

1. Confirmation of Screener Survey Information

In addition to incorporating the survey data described above, EPA sought to clarify screener survey information and collected additional information from screener survey sites in response to comments regarding the validity of EPA's database and EPA's characterization of the baseline pollutant loadings from the MPP industry. EPA contacted 34 screener survey facilities that appeared to be direct dischargers based on their screener survey responses. These 34 facilities represent direct dischargers that were not engaged in slaughtering operations (*i.e.*, they only performed further processing or rendering). The majority of these sites were identified as further processors, however, 5 sites were renderers. EPA contacted these facilities to discuss the wastewater treatment systems in place at the site in 1999 (the base year of the survey) as well as to verify the following information: Manufacturing type (*e.g.*, red meat further processor vs. poultry further processor); wastewater flows; production classification (small vs. non-small); discharge mode/wastewater management type (*e.g.*, indirect discharge to POTW, direct discharge to receiving water, land application); monitored pollutant parameters; current wastewater treatment system and target concentrations; and discharge/receiving water body. EPA obtained responses from 30 sites. Of these, 18 were in fact direct dischargers, 11 turned out to be indirect dischargers and one was not currently operating. EPA has incorporated this information into the analyses of further processors and renderers in Section 21.1., DCNs 125606 and 126002 of the docket. EPA also received discharge monitoring report (DMR) data from three further processing sites in response to these follow-up discussions. This DMR data has also been incorporated into the analyses of further processors and renderers in Section 19.3.3 of the docket. Non-confidential responses are provided in Section 19.3.1 of the public record for today's notice.

2. Confirmation of Detailed Survey Information

EPA conducted several follow-up efforts to ensure that the detailed survey data collected from MPP facilities are as complete and accurate as possible, including follow-up phone calls to facilities if survey responses were incomplete or if there were discrepancies in the data reported in the detailed surveys. EPA then made an effort to systematically confirm information for all direct discharge detailed survey recipients. Specifically, EPA mailed a summary of facility-specific responses (referred to as a ''fact sheet'') to the 58 detailed survey respondents that indicated they were direct dischargers in their survey response. EPA did not send ''fact sheets'' to indirect dischargers because, as proposed and based on further evaluation as discussed above, EPA is not considering further regulation of

such facilities in the final rule. The fact sheet requested confirmation of the following information for 1999 by product type (*i.e.*, red meat or poultry): Type of processing (*i.e.*, first processing, further processing, rendering), the related production volume, and the wastewater flows from various production operations. In addition, EPA requested information on the site's wastewater treatment system. This included confirmation of the Agency's classification of the treatment level of the facility's wastewater treatment system according to EPA's treatment option designations as identified in the cover letter to the facility; average effluent flow rate; targeted pollutant parameters (*e.g.*, BOD removal, nitrification, phosphorus removal); and confirmation of the summary of the effluent parameters and concentrations from the survey that EPA intends to use in developing pollutant loading estimates. Based on the revised fact sheets, EPA incorporated changes to its database for today's notice to the extent possible (*e.g.*, EPA is still contacting some facilities to clarify their response). See Section 19.3.2.4 of the record for copies of non-confidential letters and fact sheets.

III. Revisions to the Cost Model

A. Proposed Costing Approach

EPA proposed to establish effluent limitations based on the performance of biological wastewater treatment designed and operated to achieve denitrification. For the proposed costs, EPA used a model facility approach, applied frequency factors to obtain national estimates, and applied the CAPDET computer model.

1. Model Facility Approach

To determine the economic achievability of this technology EPA used a model facility approach to estimate the cost of installing or upgrading the wastewater treatment to achieve the limits. As described in the preamble to the proposed regulation (67 *FR* 8607), EPA developed 19 separate model facility groups based on the different combinations of production processes that are possible (for example a meat slaughtering, rendering and further processing facility as compared to a meat slaughtering and rendering facility). These model facility groups were further subdivided according to facility size based on annual production. The distribution of facilities by size and the production range defining each size group were derived from the screener survey responses, and a median wastewater flow for each model facility/size category combination was identified.

2. National Estimates Using Frequency Factors

EPA evaluated the baseline wastewater treatment technologies using information provided in response to the detailed survey as described in the proposal preamble (67 *FR* 8609). The number of facilities with specific treatment units, as reported in the detailed surveys were counted and from these counts EPA developed frequency factors, presented as percentages and applied them to the national population to represent the baseline level of treatment-in-place. These frequency factors were based upon raw counts of survey responses without regard to the sample weights, because these weights were not yet available for the proposal, due to the fact that EPA had not completed its analysis of survey results. *See* Section III.B.3 for an explanation of the survey weights. As an example of the type of frequency factor calculation used at proposal, suppose ten facilities reported a specific treatment system, then a frequency factor of 3 percent of the industry as a whole was calculated by dividing ten by the number of detailed survey responses (328), and expressing as a percent. This frequency factor was then applied to each model facility group.

3. Use of CAPDET Model

At proposal, EPA used a commercially available cost model entitled the Computer Assisted Procedure For Design And Evaluation Of Wastewater Treatment Systems (CAPDET) as one approach to estimate the costs of wastewater treatment for meat and poultry processors (67 *FR* 8609). CAPDET designs and estimates the cost of construction, installation and annual operation of wastewater treatment from the ground up, but cannot evaluate the cost of upgrades to existing equipment. Since all direct discharge MPP facilities have wastewater treatment in place, much of the costs that would be incurred by MPP facilities would be associated with upgrades to their treatment systems. Recognizing that CAPDET is not suited for addressing upgrades, EPA developed a second approach for the proposal analysis that specifically estimated the retrofit costs associated with the required upgrades (67 *FR* 8610).

B. Revised Costing Approach

Based on public comments on the proposed costing approach and the incorporation of new data, EPA has revised its approach for developing national estimates of compliance costs for the MPP industry. For the costs presented in today's notice, EPA used a facility-specific approach, applied survey weights to obtain national estimates, and developed its own computer model specific to the MPP industry.

1. Comments on Proposed Approach

EPA received several comments critical of the proposed approach for developing costs for the MPP industry. Many comments criticized the use of the frequency factor approach for estimating national costs. Commenters were concerned that this approach identified the frequency of a particular treatment technology in place without considering the varying levels of performance within that technology.

EPA also received comments regarding the use of the CAPDET model to estimate the costs of compliance. Commenters argued that CAPDET is not appropriate for estimating the costs of treating meat and poultry products wastewater. Commenters also expressed disagreement over the retrofit cost estimate arguing that this approach does not account for site specific factors and concerns such as the need to add a source of carbon which would result in an increase in the sludge produced. Some facilities may need a carbon source, such as methanol, to provide enough BOD for denitrification to occur. These aspects of the wastewater treatment requirements would result in additional costs. The commenters stated that EPA had underestimated the costs by an order of magnitude.

2. Facility-Specific Model Approach

In response to comments and because it was able to incorporate new data, EPA has substantially revised the method to estimate compliance costs since the proposal by developing a cost model specific to the Meat and Poultry Products Category. This new approach considers the costs for each facility, rather than the proposed model approach. EPA has now estimated facility specific costs for each of the 53 direct discharging meat and poultry slaughterers (*i.e.,* first processors) that responded to EPA's detailed survey. These estimates are the basis for the national estimates of costs for these subcategories. EPA classified each detailed survey facility's wastewater treatment system based on the description provided in the survey, and the summary of monitoring data also submitted with the survey. In some cases, EPA modified a facility's discharge status from direct to indirect discharger following discussions with

the facility to clarify the discharge destination of its process wastewater versus non-process wastewater. Once the facility's treatment system was classified into one of the technology options under consideration, the requirements for upgrading the system to comply with more stringent options were identified and costs were estimated for these upgrades using EPA's MPP Industry Cost Model (*see* Section III.B.4).

3. National Estimates Using Survey Weights

Instead of using ''frequency factors'' (*see* Section III.A.2) that were used as rough estimates for the proposal, EPA applied survey weights to the facility-specific estimates to derive national estimates of costs, pollutant removals, and economic impacts associated with the MPP rule. The survey weights incorporate the statistical probability that a particular facility was selected to receive the detailed questionnaire and are adjusted for any nonresponse. For example, a survey weight of 3 means that the facility represents itself and two others in the sample. Probability samples, which were used to select the facilities for the MPP surveys, allow inferences to be made to the sampling frame from which the sample was drawn. Numerous textbooks and technical journals describe a variety of ways of drawing valid probability samples and making inferences to the sampling frame from which the sample was selected. EPA determined the size (*i.e.,* number of facilities) of the probability samples by applying standard statistical equations. These samples provide an adequate database that can be used to estimate population characteristics.

Since the proposal, EPA has incorporated data from additional screener and detailed surveys into its analysis. Using this new information, EPA has revised the screener survey weights and calculated the detailed survey weights. To calculate the screener survey weights, EPA used standard survey statistics based upon the sample design and nonresponse. Appendix B of the proposal development document provides the equations used for these calculations. To calculate the detailed survey weights, EPA followed the general methodology described in Appendix B which first develops survey weights based upon the sample design, then adjusts them for nonresponse, and finally calibrates them based upon the screener national estimates. DCN 115115 provides the values of the survey weights for the non-small direct discharge slaughtering facilities in Subcategories A–D and K. This section of the NODA provides more details about the calibration step used to calculate the final detailed survey weights.

By using data from either the screener questionnaire or the detailed questionnaire, EPA could categorize the survey data into one of 14 groups described below. The availability of overlapping information was an important consideration because the screener questionnaire collected data on only a few characteristics. However, because the screener has a larger sample size, it provides better estimates of the number of eligible facilities in the MPP population. Thus, EPA used the screener estimates to calibrate the detailed survey weights, as described below, so that the national estimates from the two questionnaires would result in the same values for those characteristics contained in both surveys.

As a first step in the calibration, EPA categorized facilities into groups using the facility meat type (red meat, poultry, or a mixture) and production type (first processing, further processing, first processing/further processing, first processing/rendering, further processing/rendering, first processing/further processing/rendering). In addition, EPA gathered independent renderers into one group. As a result of crossing three meat types by six different production types and adding rendering, EPA obtained 19 possible groups of facilities. EPA further split these groups into non-small and small based on total production. As a result, EPA obtained a total of 38 possible groups of facilities.

Within each of the 38 possible groups, EPA then compared the estimated number of facilities using the screener weights to the estimates using the detailed survey weights. Because the detailed questionnaire had data for only a few or no facilities within some groups, EPA determined that it was necessary to collapse some groups. If a group had less than five respondents to the detailed questionnaire or less than 10 respondents to the screener questionnaire, EPA collapsed it with another group. Also, if the estimates from the screener and the detailed questionnaire differed by more than a factor of 2.5, then EPA collapsed that group with another to improve variance estimates. By collapsing groups, EPA obtained information about facilities with similar characteristics, and improved precision for its national estimates based upon data available only from the detailed questionnaire (*e.g.,* data about the wastewater treatment components). To perform this step, EPA determined that it was appropriate to collapse certain production types and sizes within meat type. For example, EPA collapsed the two groups for non-small red meat slaughters and non-small red meat slaughter/render into a single group. After collapsing the groups, EPA obtained the 14 groups shown in Table III.B–1.

Within each of the 14 groups, EPA then calibrated the detailed survey weights so that the national estimate of facilities using the detailed questionnaire database matched the national estimates based upon the screener data. To calibrate the survey weight, EPA used the ratio of the national estimates based upon the screener database and the detailed questionnaire database, respectively. For example, for a particular group (such as renderer), suppose that the national estimate based on the screener weights and the screener database is 30 facilities. Further suppose that 20 facilities is the national estimate based upon the detailed survey weights and the detailed questionnaire database. The ratio of the two estimates is 1.5. Thus, each detailed survey weight in the group would be multiplied by 1.5. Therefore, a detailed survey weight of 4 for a particular facility would be adjusted upward to a final survey weight of 6. Because facilities from different sampling strata could be assigned to the same group, it is possible to have facilities with different survey weights within a particular group.

Table III.B–1 provides the number of facilities in the screener database, the number of facilities in the detailed questionnaire database, and the national estimate of the number of facilities. Note the national estimates presented here include all MPP facilities (*e.g.,* direct dischargers, indirect dischargers, zero dischargers, and all facilities regardless of size) and is not the same as the national estimate of number of in-scope MPP facilities (*e.g.,* direct dischargers above the category-specific production thresholds).

TABLE III.B–1.—NUMBER OF MPP FACILITIES

Group	Number of facilities		
	Screener database	Detailed questionnaire database	National estimate
Non-small Red Meat Slaughter or Slaughter/Render	28	23	62
Small Red Meat Slaughter or Slaughter/Render	64	7	490
Non-small Red Meat Processor or Processor/Render	22	5	83
Small Red Meat Processor or Processor/Render	311	43	1873
Non-small Red Meat Slaughter/Processor or Slaughter/Processor/Render	27	25	74
Small Red Meat Slaughter/Processor or Slaughter/Processor/Render	122	16	1012
Non-small Mixed Meat	92	15	270
Small Mixed Meat	344	18	1924
Non-small Poultry Slaughter	66	22	149
Non-small Poultry Slaughter/Render	10	5	21
Non-small Poultry Slaughter/Processor, Processor, or Processor/Render	72	35	162
Non-small Poultry Slaughter/Processor/Render	10	9	24
Small Poultry Slaughter, Slaughter/Render, Slaughter/Processor, Slaughter/Processor/Render, Processor, or Processor/Render	56	6	344
Render Only	29	20	132

4. MPP Industry Cost Model

Instead of using the CAPDET model (*see* Section III.A.3), EPA developed cost equations for treatment units that were derived from a combination of vendor supplied information, data and information provided in the detailed surveys, and the comments on the proposal. Because the detailed survey did not collect information about many of the specific parameters used in the production process and treatment system of individual facilities, EPA has supplemented the facility-specific information with typical specifications or parameters derived from literature, survey results, and industry comments. For example, EPA has assumed that facilities have pipes of typical sizes for their operations. As a consequence of such assumptions, a particular facility might need a somewhat different engineering configuration from what was modeled if it has installed equipment that varies from the typical equipment or specifications used to estimate costs. However, because EPA has applied typical specifications and parameters that are broadly representative of the industry to a range of processes and treatment systems and has contacted facilities, as follow-up, to identify the site specific configuration information to the extent that the facility can furnish it, EPA considers that costs for these detailed survey facilities are reasonably accurate.

Some of the areas that EPA paid particular attention to in revising the estimates of cost, include issues associated with the pretreatment of wastewater prior to reaching the biological wastewater treatment system, such as BOD levels, the generation of sludge, and the type of disinfection.

The type of pretreatment may affect the levels of BOD entering the biological treatment system. Commenters said that pretreatment with anaerobic lagoons is so effective at reducing BOD that if facilities were required to denitrify, a source of carbon would have to be added to the wastewater to ensure that denitrification would take place. Based on industry-supplied data and a review of the literature, EPA has estimated that an influent BOD:TKN ratio of at least 3:1 is preferable for effective denitrification. EPA has thus included costs for facilities to bypass some of the wastewater around the anaerobic lagoons to supplement BOD if data indicate that the concentration of BOD leaving the anaerobic lagoon is not at least three times the concentration of TKN. Anaerobic lagoon bypass was observed at one facility EPA sampled. Because flows may be too low for effective bypass during periods of no or low operations (*e.g.,* weekends) at some facilities, EPA costed those facilities for the purchase and operation of a system to use methanol as a carbon source for denitrification. To ensure facilities can meet the low nitrogen concentrations in Option 4, EPA also costed for methanol use in the second anoxic tank during regular activity (*e.g.,* weekdays) if BOD supplementation is needed.

In conjunction with the higher BOD concentrations in the biological wastewater treatment system, EPA has also accounted for increased sludge generation and estimated costs for additional sludge dewatering and hauling. EPA has estimated the cost to upgrade the biological wastewater treatment to accomplish nutrient removals for a variety of different baseline treatment configurations, including activated sludge systems, sequencing batch reactors (SBR), oxidation ditch systems, Schreiber reactors, and Biolac systems. For each different type of biological system, EPA identified the equipment and construction that would be necessary to achieve the long-term average concentrations (*i.e.,* target effluent concentrations) considered for each option. Upgrades could include additional reaction tanks, chemical addition requiring a mixing tank and chemical storage area, piping to provide a waste stream bypass of the anaerobic lagoon, and increased sludge handling capacity.

EPA also notes that for the proposal EPA estimated compliance costs for disinfection based on ultraviolet (UV) technology because of possible concerns with the discharge of disinfection byproducts from the treatment system. However, for today's notice, EPA is instead assuming that chlorination will be the primary means of achieving fecal coliforms limits and is thus not including disinfection costs for facilities that have any type of disinfection technology in place, and is costing chlorination for the facilities that do not. EPA is also not including costs for dechlorination technology because EPA expects that facilities with water quality based limits for chlorine and/or chlorinated by-products already have dechlorination in place and that additional limits for chlorine and/or chlorinated by-products will be rare. There are no national technology based limits for these parameters (and EPA is not proposing any). EPA solicits comment on costing for disinfection using chlorination only (without dechlorination), and information on

facilities that are or may be required to comply with limits for disinfectants and/or disinfection byproducts.

IV. Revised Pollutant Loadings and Reductions Methodology

A. Proposed Pollutant Loading Approach

For the proposal, EPA established a hierarchy using available data from sampling or detailed surveys to develop baseline loads for each of the MPP model facility groups (67 *FR* 8611). The pollutant load reductions were calculated by determining the effluent loads that would be achieved by each of the regulatory options under consideration and subtracting this value from the baseline loading. The effluent loads for the regulatory options were derived from the sampling data and combined with typical flow values for each model facility group derived from the detailed surveys.

B. Revised Pollutant Loading Approach

EPA received comments which criticized the use of the hierarchy to determine baseline loads and objected to how data was transferred to derive baseline loads for all of the model facility groups. EPA has revised the proposed approach to address these comments and to develop pollutant loadings and load reductions which are consistent with the revised costing methodology. EPA's revised assessment of pollutant loading reductions was developed on a facility level similar to the revised analysis of costs. The baseline loadings presented in this notice were developed using facility specific effluent data submitted with the detailed surveys or obtained from Discharge Monitoring Reports (DMRs) from PCS. The baseline loadings in today's notice do not incorporate the weekly/daily data from the 16 slaughtering facilities that responded to EPA's request as discussed in Section II.B but do incorporate the summary DMR data for these 16 facilities. EPA also has incorporated the results from its additional sampling episodes into its determination of pollutants of concern (POC). Based upon the new data and minor modifications to the use of pre-proposal sampling data, EPA is no longer considering *Salmonella* to be a POC for the poultry subcategories and Carbaryl to be a POC for the red meat subcategories. For facilities without monitoring information for some pollutants, EPA developed a default data set which used all data available for a subcategory (*i.e.,* all data submitted with the detailed surveys supplemented by or in combination with other information from the detailed surveys and from EPA's sampling program for this regulation). Using this data, EPA developed an average effluent concentration for each regulated subcategory (*i.e.* poultry slaughterers and red meat slaughterers) for each pollutant of concern (*See* Tables IV.B–1 and IV.B–2 below) under each regulatory option to be used in the cost and loadings methodologies. EPA notes that these average target effluent concentrations are not derived using the delta-lognormal distribution used for developing the long-term average concentrations used for calculating limitations and standards. For the final rule, EPA may use the same long term averages for estimating loadings reduction that it uses for calculating limitations and standards, and expects these values will be close to those used in the NODA analysis.

Sufficient data was available from detailed surveys and sampling episodes to allow EPA to derive default baseline concentrations for poultry slaughterers and red meat slaughterers without transferring between subcategories. For developing default concentrations for baseline loadings for independent renderers, EPA used data from 12 rendering facilities, including detailed surveys, industry submitted data, DMR data from PCS and data obtained in response to screener survey follow-up (*see* Section II.E). However, because of the general lack of data for the pollutants of concern for stand-alone poultry or red meat further processors, EPA combined baseline data from both poultry and red meat further processors. The result was one set of default baseline concentrations that applied to all further processors, regardless of whether it was a poultry or red meat further processor. EPA expects that wastewater characteristics at further processors are more likely to be dependent on the processing operation (*e.g.,* breading, frying) than on the type of meat. EPA solicits comment on the differences in wastewater characteristics at red meat and poultry further processors. *See* DCN 100767 for additional information on the default baseline concentration used for today's notice. The target effluent concentrations for each regulatory option were transferred from meat slaughterers to meat further processors and independent renderers. Similarly, the effluent concentrations for each regulatory option were transferred from poultry slaughterers to poultry further processors. For the final rule, EPA anticipates using the information collected from EPA regions and states (*See* Section II.C.1) in its development of effluent concentrations for these types of facilities. However, if data for all regulatory options is not available for the final rule, EPA anticipates data transfers as presented in this NODA. EPA notes that, based on implementation of the revised (more rigorous) approach to developing loadings, there are no pollutant reductions associated with pesticides.

IV.B–1.—AVERAGE TARGET EFFLUENT CONCENTRATIONS FOR COSTS AND LOADINGS FOR SUBCATEGORIES A–D, F–I AND J BY OPTION

[mg/L]

	Option 2	Option 2+P	Option 2.5	Option 2.5 + P	Option 4
BOD	7.00	7.00	7.00	7.00	6.45
TSS	25.10	25.10	25.10	25.10	18.65
COD	125.04	125.04	125.04	125.04	125.04
CBOD	6.00	6.00	6.00	6.00	6.00
Ammonia as Nitrogen	0.895	0.895	0.895	0.895	0.185
Total Nitrogen	N/A	N/A	34.2	34.2	13.51
Total Phosphorus	N/A	8.28	N/A	8.28	5.12
Nitrate/Nitrite	N/A	N/A	20.87	20.87	10.35
TKN	3.615	3.615	3.615	3.615	3.17
O&G (as HEM)	14.05	14.05	14.05	14.05	14.05

Note: See Section IX.A for a description of the technology options.

N/A: Not applicable because technology option is not designed to control the pollutant parameter.

IV.B–2.—AVERAGE TARGET EFFLUENT CONCENTRATIONS FOR COSTS AND LOADINGS FOR SUBCATEGORIES K AND L BY OPTION

[mg/L]

	Option 2	Option 2+P	Option 2.5	Option 2.5 + P	Option 4
BOD	8.80	8.80	8.80	8.80	7.00
TSS	10.21	10.21	10.21	10.21	5.05
COD	29.60	29.60	29.60	29.60	17.25
CBOD	6.00	6.00	6.00	6.00	6.00
Ammonia as Nitrogen	1.00	1.00	1.00	1.00	0.17
Total Nitrogen	N/A	N/A	32.40	32.40	1.86
Total Phosphorus	N/A	4.20	N/A	4.20	2.27
Nitrate/Nitrite	N/A	N/A	20.87	20.87	0.52
TKN	4.97	4.97	4.97	4.97	1.34
O&G (as HEM)	5.90	5.90	5.90	5.90	5.39

Note: See Section IV.A for a description of the technology options.
N/A: Not applicable because technology option is not designed to control the pollutant parameter.

V. Changes Considered to Applicability, Definitions, and Regulated Pollutants

A. Changes Considered to Applicability and Definitions

EPA received comment on the size thresholds in the proposed rule, as well as a request from permitting authorities to clarify the overlap between the Concentrated Animal Feeding Operations (CAFO) rule and the MPP rule. This section discusses changes EPA is considering for the final rule including: (1) Changes in the production based thresholds; and (2) clarification on the distinction between CAFOs and animal holding areas in the MPP industry.

EPA based the proposed production thresholds and its definition of ''small'' facility on available screener survey data (67 FR 8587). As discussed in Section II.E of today's notice, EPA is including additional screener surveys as well as detailed surveys in its analysis for this NODA. If EPA determines that the economic achievability, cost-effectiveness, or environmental benefits of the rule can be enhanced by revising the production-based thresholds, EPA will consider revising the thresholds for the final rule. EPA notes that although one commenter requested a higher production threshold for poultry facilities (*e.g.*, 100 million versus 10 million pounds per year) for determining applicability of the effluent guidelines limitations and standards, they did not provide any information that would serve as a basis for EPA to revise the proposed production based thresholds.

Please note that, in error, EPA also solicited comment on its use of 100 employees at the facility level for analyzing economic impacts on small businesses. In fact, EPA used the SBA size standard of 500 employees at the company level to perform its small business impact analyses for both the proposal and today's notice and will continue to do so for the final rule.

Subsequent to promulgating the final CAFO rule earlier this year (68 FR 7176; February 12, 2003), EPA received a request from permitting authorities to clarify the distinction between animal feeding operations (AFOs) and animal holding areas at MPP facilities to avoid any ambiguity about which permit requirements and effluent guidelines apply to discharges from the MPP animal holding areas. EPA's NPDES regulations at 40 CFR part 122.23(b)(1) define an AFO as ''a lot or facility (other than an aquatic animal production facility) where the following conditions are met: (1) Animals (other than aquatic animals) have been, are, or will be stabled or confined and fed or maintained for a total of more than 45 days or more in any 12-month period, and (2) Crops, vegetation, forage growth, or post-harvest residues are not sustained in the normal growing season over any portion of the lot or facility.'' All meat and poultry slaughtering facilities have live animal receiving areas. Although the animals at MPPs are not typically kept or maintained for more than a day, animals are present for more than 45 days in a 12 month period. Therefore, the AFO definition could be construed to include animal holding areas at meat and poultry slaughtering facilities.

EPA does not interpret the AFO definition to include animal holding areas at meat and poultry slaughtering facilities. Furthermore, the CAFO rules do not establish requirements for MPP animal holding areas. Meat slaughtering and processing operations currently fall under the Meat Products Point Source Category at part 432. The MPP rule, as proposed, would add requirements to part 432 for poultry processing plants. Wastes from animal holding areas at MPP facilities were identified during the original effluent guidelines rulemakings in the 1970s as being part of the MPP facilities' process wastewater and the requirements at part 432 apply to these wastes. NPDES permits have historically addressed the animal holding areas at processing facilities as part of the meat processing facility rather than as an animal feeding operation. Given the effectiveness of this approach, EPA does not intend to change the applicability of the MPP rules to animal holding areas. Rather this Notice is clarifying that animal holding areas at meat and poultry slaughtering facilities are still subject to the requirements of the MPP rule codified at 40 CFR part 432 and are not subject to the NPDES CAFO requirements codified at 40 CFR part 122 or the CAFO effluent guidelines codified at 40 CFR part 412.

To avoid potential confusion, EPA may include regulatory language in the applicability section of the MPP rule clarifying that animal holding areas at meat and poultry slaughtering facilities are subject to the requirements codified at part 432 and not the CAFO requirements at parts 122 or 412, and solicits comment on this aspect of the applicability language for part 432.

B. Changes Considered to the Pollutants Selected for Regulation

Based on comments on the proposed rule, EPA is considering a revision to the pollutants it proposed for regulation (*i.e.,* Ammonia (as N), BOD_5, COD, Fecal Coliforms, O&G (as HEM), Total Nitrogen, Total Phosphorus, and TSS). EPA notes that the selection of pollutants proposed for regulation was subcategory-specific and size-specific and not all pollutants were proposed for each subcategory, facility size, or limitation type (*e.g.,* BPT, BAT). (See rule text of the proposed rule for a

specific list of proposed parameters for each subcategory; 67 FR 8657).

EPA proposed adding COD to the BPT limitations for non-small facilities (*i.e.,* based on subcategory-specific production thresholds) in Subcategories A–D and F–J to better reflect the design and operation of the existing BPT treatment technology (67 FR 8630). Commenters stated that biological treatment systems in place at meat products facilities are not designed or operated based upon COD removal and that doing so would be financially burdensome. In addition, commenters state that BOD or CBOD (carbonaceous BOD) would be a more appropriate measure for monitoring biological treatment system performance. EPA agrees that COD may not be an appropriate indicator of biological treatment technology performance at MPP facilities. Based on EPA's analysis of new data and the complete survey information, EPA is more likely to retain the current limits for BOD (and other conventional pollutants) and add total nitrogen to the BPT limitations for Subcategories A–D and F–J to reflect the partial denitrification currently occurring at many of these facilities (*see* Section IX for a discussion of options EPA is considering for BPT for the final rule). In this case, EPA would not regulate COD or CBOD in the final rule, because COD would not provide much useful information and CBOD would be somewhat redundant with the current BOD limitations and standards.

For BAT limitations, EPA is still considering the regulation of ammonia (as nitrogen) for small facilities (below the subcategory-specific production thresholds) in Subcategories A–D, F–I, and K–L and all of the facilities in Subcategory J, as proposed. Also, depending on the option EPA selects for the final rule, EPA is considering the regulation of ammonia (as nitrogen), total nitrogen, and/or total phosphorus for non-small facilities (above the production thresholds) in Subcategories A–D, F–I, and K–L, as proposed. Note that if EPA does not select a model technology for the BAT level of control that includes phosphorus removal, EPA would not regulate total phosphorus at BAT. The same holds true for the new source performance standards (NSPS).

C. Concerns Regarding Fecal Coliforms Limitations and Standards

For the proposal, EPA retained the existing limitation/standard of ''Maximum of 400 MPN per 100 ml at any time'' of fecal coliforms for BPT and NSPS for Subparts A through I (*i.e.,* red meat subcategories) and Subpart J (*i.e.,* independent rendering). In addition, EPA proposed the same fecal coliforms values for the BPT limitations and NSPS for Subparts K and L (proposed poultry subcategories). Based on analysis conducted for the proposal, EPA tentatively determined that this level was achievable by poultry facilities. As a result of the proposal, EPA received comment on several issues regarding the proposed and existing limitations and standards for fecal coliforms. This section addresses the major comments that the Agency received.

1. Reporting Units

Commenters requested EPA to allow for monitoring of fecal coliforms to be reported in units of colony forming units (CFU) per 100 milliliters (mL) in addition to the units of most probable numbers (MPN) per 100 mL specified in the existing regulations. To obtain results in units of MPN per 100 mL, the laboratory uses the multiple-tube fermentation technique. To obtain results in units of CFU per 100 mL, the laboratory uses a membrane filtration which is a direct plating method in which samples are filtered through 0.45um membrane filters that are subsequently transferred to petri dishes containing a selective or differential agar medium. Based on the research of Thomas and Woodward in ''Estimation of Coliforms Density by the Membrane Filter and the Fermentation Tube Methods'' (DCN 165320), results from either technique can be considered comparable, so long as the volume analyzed is equivalent. This finding of comparability is consistent with documentation for the existing fecal coliforms limitations and standards (*see*, for example, page 154 of the 1974 development document for the renderer segment (EPA 440/1–74/031–a) where EPA states ''This method [membrane filter procedure] and the multiple-tube technique which results in a MPN (most probable number) value, yield comparable results.''). Therefore, EPA is considering revising the limitations and standards to allow for results to be reported in either MPN units or CFU units per 100 ml. EPA solicits comment on this possible revision.

2. Impact of UV Technology

Several commenters were concerned with the industry's ability to consistently achieve the existing and proposed fecal coliforms limitation/standard of 400 MPN/100 ml at ''any time'' with the use of ultraviolet radiation (UV) technology. Some facilities are using this technology as an alternative to treatment using chlorination which is itself associated with some environmental concerns. As discussed in Section III.B, for the proposal, EPA estimated compliance costs for disinfection based on UV technology. However, for today's notice, EPA is not including costs for facilities that have any type of disinfection technology in place and is costing chlorination for the three facilities that do not currently have any type of disinfection. The model technology does not include a dechlorination step. For the final rule, EPA intends to evaluate the achievability of the fecal coliforms limitation/standard using UV treatment. In its preliminary review, EPA is investigating whether the samples are likely to be extremely turbid for which UV treatment would not sufficiently kill fecal coliforms without agitation during the treatment step. As part of its preliminary review, EPA considered its sampling episode data from the facility with UV technology (episode 6486). This review showed that discharges of fecal coliforms are well below the current limitation/standard, because the concentrations ranged from non-detected to a measured value of 166 MPN/100 mL. For the final rule, EPA intends to further review these sampling episode data and to consider the self-monitoring data from facilities that use UV technology. EPA solicits comments and data on UV performance and costs for reducing fecal coliforms in MPP wastewaters. EPA also solicits comment on the extent to which water quality standards are driving the MPP industry to shift from chlorination/dechlorination to UV to achieve water quality standards for chlorine and whether this shift necessitates a revised fecal coliforms limit that is consistently achievable with UV technology.

3. Holding Times of EPA Sampling Data

As explained in Section II.A.2, when EPA conducted its own sampling episodes at the facilities, it exceeded the required holding time for some samples for fecal coliforms. DCN 165310 in Section 22.6 of the public record lists the holding times and fecal coliforms measurements from the EPA sampling episodes.

For red meat facilities, where EPA is retaining the previously promulgated limitations and standards, EPA is considering using the fecal coliforms data from the EPA sampling episodes for some analyses such as (1) calculations for loadings and (2) evaluation of treatment performance by comparing influent and effluent data. For the treatment technologies that EPA is currently considering, all of the red meat data from sampling episodes are associated with holding times of about

24 hours. Based on the results of the holding time study (*see* Section II.A.2 above), EPA is considering using the 24-hour data for these analyses. Note that EPA does not intend to revise the current limitations and standards for red meat facilities, and thus, is not using these data to develop limitations and standards for fecal coliforms. EPA requests comment on the use of the 24-hour holding time data for analysis of loadings and treatment performance at red meat facilities.

For poultry facilities, where EPA is transferring the existing limitations and standards from the red meat subcategories, EPA will only use data associated with the 8-hour holding time for its loading analysis because the holding time study indicated that longer holding times for poultry processing wastewaters were not comparable to the 8-hour period. Because only one sampling episode (6304) meets this criterion, EPA will base its loadings and other analyses on fecal coliforms data from this single sampling episode and any appropriate self-monitoring data. EPA will also use these data in evaluating the achievability of the limitations that EPA intends to transfer from the existing limitations for the red meat subcategory. EPA requests comment on the transfer of limitations for the poultry subcategory from the red meat subcategory, and on its planned use of data to analyze loadings and treatment performance.

4. Extending Holding Times in 40 CFR Part 136

As discussed in the preamble to the proposed rule (67 FR 8631), EPA planned to conduct the holding time study for two purposes: to evaluate the use of data in developing loadings estimates and limitations/standards, and for possible revisions to current holding time requirements. The previous section addresses EPA's intended use of the data for developing loadings estimates. Because the study collected data from only three facilities in the MPP industry, EPA does not consider the study results to provide a sufficient basis to revise the holding times specified in 40 CFR part 136 which apply to all industries.

5. Monitoring of Both Fecal Coliforms and *E. coli*

As part of its evaluation of the existing guidelines, EPA has reviewed its use of fecal coliforms as a regulated parameter. On page 68 of the1974 development document for the renderer segment (EPA 440/1–74/031–a), EPA explained that it selected fecal coliforms as an indicator parameter because ''they have originated from the intestinal tract of warmblooded animals. Their presence in water indicates the potential presence of pathogenic bacteria and viruses.'' However, EPA subsequently issued a guidance document for water quality criteria that recommends the monitoring of *E. coli* or enterococci rather than fecal coliforms in recreational waters. (*See* ''Ambient Water Quality Criteria for Bacteria—1986,'' January 1986, EPA440/5–84–002.)

While EPA has not validated an analytical method for *E. coli* in industrial wastewaters, which consist of considerably more complex matrices than ambient waters, it has analyzed for *E. coli* in MPP wastewaters using Standard Method 9221F and this appears to have provided reasonable estimates of the *E. coli* concentrations, based upon EPA's evaluation of the laboratory reports. However, EPA does not consider these data to be appropriate to use in developing limitations and standards for *E. coli.* Instead, EPA considers the *E. coli* data to be appropriate for general comparisons of *E. coli* and fecal coliforms concentrations in MPP wastewaters. For the pork and beef facilities in the holding time study, the *E. coli* and fecal coliforms concentration values were identical. For the effluent from the sampling episodes corresponding to the model technologies, the values of *E. coli* and fecal coliforms are identical for most samples. Thus, because fecal coliforms and *E. coli* in MPP effluent generally have similar concentration values, EPA continues to consider that fecal coliforms prove a reliable indicator parameter for *E. coli.*

While EPA considers fecal coliforms to be the appropriate parameter for regulation for the MPP industry, EPA recognizes that some states and tribes may still prefer that facilities monitor directly for *E. coli.* Because concentrations of fecal coliforms and *E. coli* are similar, EPA is considering an alternative that would allow facilities to monitor for *E. coli* instead of fecal coliforms in the effluent. This alternative would be available when EPA amends 40 CFR part 136 to include an analytical method for *E. coli* in industrial effluent. EPA expects to promulgate such a method in the next few years. EPA is currently conducting validation studies of this method, and expects to propose this method in 2004.

In this alternative, EPA would allow a facility to monitor for *E. coli* rather than fecal coliforms after the facility certified that the concentrations of the two parameters were similar in the final effluent. As part of the application process for this certification, the facility would be required to submit data demonstrating the similarities of concentrations of fecal coliforms and *E. coli* in its facility's wastewater over an extended period of time (perhaps a month or longer). If the permit authority determined that the *E. coli* concentrations had values that, on average, were greater than some ''cutoff'' percent (for example, 75 or 90 percent) of the fecal coliforms concentration values, then the certification would allow the facility to monitor for *E. coli* rather than fecal coliforms. In this instance, the permit would contain an *E. coli* limitation/standard set equivalent to the same numerical value as the existing fecal coliforms limitation/standard for that facility. If the *E. coli* concentration values, on average, were lower than the cutoff percent of the fecal coliforms concentration values, then under this possible approach the permitting authority would be able to establish a limitation/standard for *E. coli* in place of fecal coliforms only if the numerical value for the *E. coli* limitation/standard in the facility's permit would be reduced by an appropriate amount from the fecal coliforms limitation/standard for that facility. Note that EPA is not proposing to set national limitations for *E. coli,* because EPA lacks the data necessary to set such limitations. EPA believes, however, that the alternate approach discussed here could avoid the need to monitor for both *E. coli* and fecal coliforms in cases where the permitting authority believes *E. coli* is the more appropriate indicator.

EPA solicits comment on this alternative and the specifications it is considering. EPA also solicits comments on whether this alternative would be beneficial for facilities, even though facilities could not use this method until EPA has adopted an approved method for *E. coli* in industrial effluent. Note that EPA is not proposing to set national limitations for *E. coli* as part of the MPP rule, because EPA lacks the information necessary to set such limitations at this time.

D. Concerns About Total Nitrogen Limitations and Standards

At the time of proposal, EPA expressed a tentative view that limits based on the performance of poultry products facilities could also be achieved by meat products facilities. EPA received comment from industry stakeholders indicating that the relative proportions of nitrogenous BOD and carbonaceous BOD differ in poultry wastewaters from red meat wastewater.

Because of these differences, commenters were concerned that it would be inappropriate to transfer total nitrogen limitations from poultry to red meat subcategories. Based on the evaluations discussed below, EPA is considering transferring total nitrogen limitations from poultry to red meat subcategories for the final rule.

EPA has performed a comparison of the poultry and meat processing wastewaters after anaerobic lagoon treatment (*See* DCN 100765). In this comparison, using data from surveys and sampling episodes, EPA evaluated parameters which are commonly used to determine the characteristics of wastewater for biologically-based treatment systems. These parameters included 5-day biochemical oxygen demand (BOD), chemical oxygen demand (COD), oil and grease, nitrogen, phosphorous, and total suspended solids (TSS) as well as biokinetic parameters (*i.e.,* maximum specific growth rate, the half saturation constant, decay rate, and yield coefficient). EPA concluded that wastewater strength and biodegradation rates of poultry processing wastewater and meat wastewater are similar and fall within the same general ranges (*e.g.,* the average concentration for COD in the poultry processing wastewater was approximately 851 mg/L compared to 961 mg/L and for meat processing wastewater). However, EPA found the average TKN and ammonia concentrations of meat processing wastewater are somewhat higher than those of poultry processing wastewater (*e.g.,* 265 mg/L TKN for meat compared to 109 mg/L TKN for poultry; 162 mg/L ammonia for meat compared to 54.5 mg/L for poultry). Nitrogen in poultry processing and meat processing wastewaters after anaerobic treatment is primarily present as ammonia. Since the substrate in both types of wastewater is the same and the nitrification systems are universal, it is reasonable to apply treatment systems used for nitrifying poultry wastewater may to meat processing wastewater. However, higher ammonia and TKN concentrations in meat wastewater after anaerobic treatment may warrant modifications in design and operational characteristics of the treatment system; therefore, EPA has included costs for such modified design and operational characteristics when estimating compliance costs for meat products facilities. For example, higher TKN can result in a BOD:TKN ratio that is lower than what is needed to achieve denitrification and, as discussed in Section III, EPA has included costs for an additional carbon source such as methanol, when appropriate, to achieve the needed BOD:TKN ratio.

EPA notes that treatment systems for BOD removal, nitrification, denitrification, and phosphorus removal systems are universal. This observation is consistent with our review of treatment systems of both industries which reveals that many of the treatment processes used to treat poultry processing wastewaters are also used to treat meat processing wastewaters. Thus, EPA expects that many of the same modifications to existing poultry processing plants for enhancing biological nutrient removal can be used for meat processing wastewater treatment options. However, EPA recognizes that when meat processing facilities incorporate these enhancements specific operating parameters and treatment effectiveness may be different than for poultry facilities, depending on the specific characteristics of the influent wastewater. EPA requests comments and data that would help to establish the differences and similarities between poultry and meat processing wastewater, and the implications of these similarities and differences for the relative treatability of each.

In its consideration of the total nitrogen reductions, EPA thought that Ultimate BOD (UBOD) analyses performed on wastewater from poultry and meat facilities could be used to determine whether the carbonaceous and nitrogenous portions in BOD are similar (or not) at the two types of facilities. While EPA has not yet fully evaluated this, EPA collected samples and conducted UBOD analyses (using Standard Method 5210C and EPA Method 353.1) in samples of raw wastewaters and treated effluents from one poultry and one meat facility. From the poultry facility (episode 6493), EPA analyzed UBOD in eight samples collected on two sampling days at four sampling locations. From the meat facility (episode 6496), EPA analyzed six samples collected on three days at two sampling locations. The analysis of UBOD provides measurement of dissolved oxygen (DO), nitrate/nitrite, CBOD, and nitrogenous BOD (NBOD) in a sample over a period of 25 days. (NBOD is calculated by applying a multiplier of 4.57 to the nitrate/nitrite concentration value.) For each sample, there are 16 measurements of each parameter as a result of analyzing aliquots every day for the first five days and every other day until the end of the 25-day time frame. EPA will use these measurements, located at DCNs 165460 and 165470, to evaluate the degradation rates of BOD and nitrification in the wastewaters. To evaluate these rates, EPA intends to compare the general pattern of the degradation curves for the samples for each facility. However, EPA is concerned that the UBOD data for the poultry facility may be minimum values, because total DO depletion occurred on one or more days for all samples, which would artificially limit measured BOD on subsequent days. Thus, EPA is not sure how useful this analysis will be in comparing poultry and meat processing wastewaters. EPA requests comment on this issue.

EPA may also use the UBOD data to evaluate some other aspects of its costing model. For example, for some facilities it was necessary for EPA to estimate aerobic volume; in order to do this, EPA needed both BOD degradation and nitrification rates. For these estimates, EPA derived default biodegradation rates based on literature and some limited data submitted as part of the MPP detailed survey. EPA may be able to use the UBOD data to evaluate the estimates of the biodegradation rates and to develop any appropriate adjustments for MPP wastewaters.

EPA solicits comments on its initial comparison of poultry and meat processing wastewaters. In addition, because industry representatives have expressed some concerns about the applicability of UBOD analyses to total nitrogen performance, EPA solicits comments on the appropriateness of using the UBOD data to determine total nitrogen performance in the two subcategories and whether other information would be more relevant. EPA also solicits comments on the applicability of the UBOD data for estimating BOD biodegradation rates and nitrification rates for use in its cost model. Further, EPA solicits additional data on UBOD in raw wastewaters.

E. Data Selection for Oil and Grease Loadings and Limitations/Standards

The proposed limitations for oil and grease were based upon data from EPA sampling episodes. For these samples, EPA used EPA Method 1664 to measure the oil and grease concentrations. Method 1664 uses normal hexane (n-hexane) as the extraction solvent, instead of Freon which is an ozone-depleting agent. Because EPA had developed its proposed limitations using Method 1664 data, it expressed the limitations as oil and grease measured as n-hexane extractable material (HEM). (Defined at 67 FR 8658).

EPA also had two other reasons for expressing the limitations as HEM. First, there are environmental concerns associated with the older methods that

use Freon, which is an ozone-depleting agent. Second, EPA expects that facilities will choose to use Method 1664 in the future rather than Freon methods, because Freon is expected to become more expensive and difficult to obtain. For these two reasons, EPA expects to promulgate the final limitations for ''oil and grease measured as HEM.'' As a consequence, compliance monitoring would require the use of a method, such as Method 1664, that measures oil and grease as HEM.

With the incorporation of industry self-monitoring data, EPA now has oil and grease concentration data measured by Freon methods. Because these data do not measure oil and grease as HEM, EPA has excluded them from its analyses and loadings estimates for the NODA. However, EPA acknowledges that at the time of development of Method 1664, EPA had explained that Method 1664 and Freon methods generally provide comparable results for industrial wastewaters (*see,* for example, *http://www.epa.gov/waterscience/methods/1664fs.html*). However, during the development of Method 1664 and subsequently, some industries have expressed concerns about potentially differing results from the two methods. In response to these comments, EPA has provided guidance for facilities to evaluate if the two methods are comparable in their own wastewater. (See chapter 2 in ''Analytical Method Guidance for EPA Method 1664A Implementation and Use (40 CFR part 136),'' February 2000, EPA/821–R–00–003; DCN 165620). EPA solicits data from any MPP facilities that may have performed this comparison in the MPP wastewaters.

Before the final rule, EPA may assess whether the oil and grease data between the two methods appear to differ within the same model technology options. (*See* DCNs 165011, 165140, 165070, 165150 for the data and summary statistics.) Further, if data from both a Freon method and Method 1664 are available from the same facility, then EPA intends to compare the concentrations from the two methods for that facility. Depending on the results of these comparisons, EPA may incorporate the Freon-based data into its development of the final limitations/standards for oil and grease. In this case, EPA would also consider allowing the use of Freon-based methods for compliance monitoring. EPA solicits comments on whether it should use only Method 1664 data in calculating its loadings and final limitations/standards for oil and grease measured as HEM.

VI. New Information and Consideration of Revisions to Economic Methodologies

A. Closure Analysis

For the proposed rule, EPA projected facility level economic impacts using a probability model derived from Census data because detailed survey financial information was not available at proposal. See Section II.E for discussion of incorporation of additional survey information. However, in the Economic Analysis (EA) document supporting the proposal, EPA presented the economic impact methodology it intended to use for the final rulemaking. EPA received several comments recommending modification to this methodology. EPA intends to use the methodology proposed for the final rulemaking with some modifications in response to these comments. Additionally, EPA may use some Census data to perform analyses in subcategories for which adequate detailed survey data are not available. Based on comments and incorporation of additional data, EPA is considering revisions to the proposed economic analysis methodology in the following areas: projection of future facility income, tax shields, and company level aggregation and closure analysis. The revisions that EPA is considering are discussed below.

1. Forecasting Future Facility Income

For the proposal, EPA stated it would use the survey period, 1997 to 1999, as the baseline for projecting facility and company net income for use in the closure model. Commenters objected to the use of this period as the baseline because unusual supply and demand conditions resulted in unusually large margins for meat companies, and therefore, atypically profitable years.

EPA concurs with this assessment. To address these concerns EPA developed a forecasting model that uses historical data on the periodic cycles of the relevant markets to generate an index. This index is used to forecast net income for MPP facilities, accounting for cyclical effects on profits. EPA has used this model for the analyses in today's notice and is considering its use for the final MPP rule.

In the red meat sectors, EPA used U.S. Department of Agriculture's Economic Research Service (USDA/ERS) time series on the monthly farm-to-wholesale price spread to develop its margin forecast. To forecast the margin in the poultry sector, EPA developed a new monthly time series by subtracting the USDA/ERS broiler wholesale production cost time series from its broiler wholesale price time series. These time series, which ran from 1970 to 2002 for beef and pork, and from 1990 to 2002 for poultry, were converted to constant 1999 prices. To deseasonalize each time series, EPA calculated each month's value as the average price spread for a 12 month period centered on that month (*i.e.*, a 12-month centered moving average). The price spread time series were deseasonalized because each series reflects cyclical behavior within each year as well as over longer time periods (*e.g.*, each year the demand for turkey peaks in November and December). Deseasonalizing the farm-to-wholesale price spread time series data set enables EPA to focus on the longer-run cycles.

From the time series data for each sector, clear, consistent cycles were readily identifiable. EPA used these cycles to develop a ''normal'' or ''average'' cycle for each meat type. To test the validity of the normal cycle pattern, the normal cycle was used to remove the cyclical component (de-cycle) from the moving average time series for the farm-to-wholesale price spread. After de-cycling, these time series showed only random variation and the general trend of the original series, indicating that the cyclical variation in these data sets had been successfully captured by the model. The cycles were then used to forecast the wholesale margin for the 2003 to 2018 time period. Complete details of the methodology used to measure and forecast the wholesale margin cycles are provided in the docket (*see* Section 21.2, DCN 125502).

EPA used the historical and projected wholesale margin time series to develop indices. These indices are applied to survey net income data to forecast facility and company earnings for use in the closure model. Net income was projected to vary directly with the farm-to-wholesale price spread; as the spread narrows, net income declines. As commenters pointed out, the 1997 to 1999 survey period was at or near the peak of a cycle, and as a result net income could be expected to decline as industry moved toward the cycle trough. Therefore, EPA selected cycle high points (largest annual margin) for the base period of its indices. Index values for succeeding years were calculated as the proportion of each year's margin to the base period margin.

In addition, EPA had to select a starting value for net income to which the indices are applied. EPA ran a series of net income projections. Each run used a different combination of net income starting point and cycle index. From these combinations, EPA selected

the following five projection methods for net income:

- Using a simple average of 1997, 1998, and 1999 net income projected over the 15 year project life to provide an unsophisticated baseline;
- Using 1999 net income as the start point for projections using Cycle 1 in Table VI.A.1 (index initial value is 1999);
- Projecting three different net income time series, all using Cycle 2 in Table VI.A.1 (index initial value is the largest margin in the 1995 and 2002 period), but starting from different detailed survey data points: maximum, average, and minimum facility net income.

As described in the proposal EA (Section 3.2.2), EPA uses the preponderance of evidence under different forecasting methods to determine if a facility is projected to close. Because EPA intends to use five forecasting methods for the final rule, a facility is projected to close if the present value (PV) of future compliance costs exceeds the forecast PV of net income under three of the five forecasting methods. EPA notes that the results of these five methods are not independent and is considering basing its closure analysis for the final rule on a subset of these methods. EPA solicits comment on this forecasting model for future facility income in the MPP industry.

As a sensitivity analysis, EPA also projected closures if the PV of future compliance costs exceeds the forecast PV of net income under one of the five forecasting methods. The results of this sensitivity analysis can be found in the docket at DCN 125607.

TABLE VI.A.1.—BUSINESS CYCLE INDICES FOR FORECASTING NET INCOME

Cycle 1				Cycle 2		
Year 1 of Cycle Equals 1999				Year 1 of Cycle Equals High Point of 1995–2001		
Year	Beef	Pork	Broilers	Beef	Pork	Broilers
1	1.00	1.00	1.00	1.00	1.00	1.00
2	1.05	0.84	0.79	0.96	0.84	0.81
3	1.05	0.84	1.64	0.94	0.84	0.63
4	1.01	0.83	1.15	0.98	0.83	0.95
5	0.99	0.87	1.04	0.86	0.87	0.61
6	1.03	0.79	1.61	0.83	0.79	0.48
7	0.91	0.67	1.20	0.86	0.67	0.99
8	0.88	0.66	1.04	0.91	0.66	0.70
9	0.90	0.79	1.61	0.80	0.79	0.63
10	0.96	0.77	1.20	0.76	0.77	0.97
11	0.85	0.65	1.04	0.78	0.65	0.73
12	0.80	0.60	1.61	0.83	0.60	0.63
13	0.82	0.70	1.20	0.75	0.70	0.97
14	0.88	0.75	1.04	0.70	0.75	0.73
15	0.79	0.63	1.61	0.70	0.63	0.63
16	0.73	0.56	1.20	0.75	0.56	0.97

2. Tax Shields

EPA received comments on its methodology for estimating investment tax shields on new wastewater treatment technology. One comment pointed out that EPA's methodology apparently failed to deduct interest payments from the revenue base used to determine the tax rate applicable to tax shields, though it did subsequently subtract out interest payments to yield net income. This could produce an overestimate of the tax shields the company accrues on its investment in wastewater treatment equipment. EPA agrees with this commenter, and for the analysis supporting this notice has subtracted interest payments from earnings before interest and taxes (EBIT) to determine both taxable income and the applicable tax rate.

A second comment on EPA's method for estimating tax shields stated that EPA's methodology would overestimate tax shields if incremental compliance costs decrease earnings before taxes to such an extent that a facility's marginal tax rate changes. EPA examined estimated compliance costs and net income for each facility, and found that in practice there would be no effect on estimated tax shields. In the vast majority of cases, no change in tax rates would result given the magnitude of projected compliance costs. For one facility where the tax rate could have changed due to the incremental compliance costs, EPA's method of limiting estimated tax shields so they cannot exceed taxes actually paid resulted in a smaller estimated tax shield than if EPA estimated its tax shield by incorporating the change in rates.

3. Aggregation of Company Level Costs and Company Level Closure Analysis

Following proposal, EPA completed review of the detailed surveys (see Section II for discussion on completion of survey review). Less than 40 percent of direct discharging facilities provided facility level financial data in the detailed survey. Industry has stated that many companies in the MPP industry do not maintain financial records at the facility level. Instead they maintain their financial records at, for example, the company level, division level or product line level. As a result, EPA was unable to scale up its facility level closure analysis to produce a national-level projection of closures. Rather, for each facility for which there was sufficient data, EPA recorded the closure status of the associated number of facilities as ''unknown.''

EPA did collect company level financial data and when necessary this data can be supplemented using publicly available data. Therefore, EPA is considering a closure analysis at the company level in addition to the facility level analysis and has performed that analysis for today's notice (see Section VI for estimated economic impacts). This requires EPA to estimate compliance costs at the company level as well as the facility level. The Altman Z' analysis, described in the proposal EA (Section 3.1.3.2) document, is also a company level analysis and so EPA used the same method for estimating company level costs for both models.

The company level closure analysis is identical to the facility level closure analysis in that EPA projects the net present value (NPV) of each company's net income over the 15 year project life. Salvage value is assumed to equal zero, as proposed, for the reasons described in DCN 125505. EPA excludes salvage value from the closure analysis because academic studies and EPA experience on previous projects both demonstrate that it is extremely difficult to estimate accurately. Therefore, inclusion of salvage value would add a highly arbitrary component to the closure analysis. The NPV of projected compliance costs is subtracted from the NPV of projected net income; if this value is positive, the company is deemed to remain open, if this value is negative, the company is projected to close, with associated losses in output and employment.

To estimate company level compliance costs, EPA reviewed the 55 non-small detailed survey direct discharging facilities to determine their corporate parent, then compiled a list of all other meat processing facilities owned by each of those corporate parents. EPA primarily relied on the screener survey and the PCS database to estimate the number of direct discharging facilities owned by these corporate parents that were not represented in the detailed survey database. EPA estimates that the 26 corporate parents of those 55 direct dischargers owned about 345 MPP facilities in 1999. EPA then determined the discharge status of these 345 facilities because indirect discharging facilities will not incur costs under this regulation, and estimated that of the 345 facilities owned by these corporate parents, approximately 125 were direct dischargers. Of these 125 direct dischargers, 55 received detailed surveys, and 70 required analysis based on non-survey data.

To estimate compliance costs attributable to the 70 non-surveyed facilities, EPA applied mean compliance costs by meat type (red meat or poultry) to each non-surveyed facility. EPA examined alternative means of allocating compliance costs to these facilities, such as matching costs from detailed survey facilities based on meat type and processes performed. EPA determined that applying average costs by meat type to non-surveyed facilities resulted in more conservative (*i.e.*, higher) cost estimates. See DCN 125501 for additional information on the estimation of non-surveyed direct discharge facilities. EPA solicits information on the actual number of non-surveyed direct discharging facilities that are owned by each parent company identified and the production type of these facilities (*e.g.*, first processor, further processor, renderer). EPA notes that, for the final rule, it is considering using a company-specific mean compliance cost if additional financial data is received in response to today's notice. EPA did not attempt to scale up the projected company closures to correspond to a national estimate because EPA lacks data on which to base sample weights for the 26 companies. Thus, the company level analysis reflects closures only among the 26 companies analyzed. EPA made an effort to determine whether there are additional companies that own direct discharging MPP facilities and found three additional companies based on the screener survey results that may own direct discharging MPP facilities. Therefore, the company level analysis could underestimate the number of company closures nationally. EPA solicits comment and information on the presence of additional companies that have facilities within the scope of the MPP rule.

In addition, EPA solicits comment on the aggregation of facility level compliance costs to the company level, and the use of a company level closure analysis. In addition, EPA solicits comment on the methodology used to estimate compliance costs for the closure analysis for the 70 non-surveyed facilities which are owned by the same parent companies as the 55 detailed survey recipients.

B. Trade Elasticity Methodology

Commenters on the proposed rule raised concerns over EPA's assessment of foreign trade impacts for poultry facilities. Specifically, the commenters stated that EPA did not adequately address the impact of the proposal on poultry exports. Based on these comments, EPA has reviewed its methodology and is considering revising it for the final rule.

For the proposed rule, EPA analyzed trade impacts through the international trade component of EPA's MPP market model. The primary determinant of trade impacts are the trade elasticities specified for the model. EPA derived its trade elasticities based on Armington's framework in which one country's meat products are an imperfect substitute for those of other countries. After review of the proposal model, EPA is considering revising its derivation of trade elasticities for the final rule, and is using the revised trade elasticities for the analyses supporting today's notice. EPA also examined but rejected an alternative derivation of trade elasticities based on Orcutt's framework in which each country's meat products are perfect substitutes for those of any other country for the reasons described below.

EPA selected the Armington specification based on the fact that the U.S. both imports and exports meat products. If U.S. consumers consider U.S. meat products and foreign meat products to be perfect substitutes, there would be no reason to simultaneously import and export these products. This intuitive explanation is supported by econometric evidence (Galloway, *et al.* 2000). In addition, analysts have observed that U.S. poultry exports are largely composed of dark meat which is considered inferior by U.S. consumers but is preferred by foreign consumers (Aylward, 2002; Salin *et al.,* 2002; Standard & Poor's, 2000). Thus, EPA determined that the Armington framework is conceptually more appropriate for modeling trade in meat and poultry products than a framework that treats all meat products as perfect substitutes.

EPA used Armington's (1969a, 1969b) expressions for partial and cross-price elasticities of demand for a traded product to derive trade elasticities for meat products. The key data points for this estimation are: (1) The price elasticity of domestic demand for meat products regardless of the country of origin, (2) relative trade shares between the home country and its trading partner(s), and (3) the elasticity of substitution between each country's meat products. EPA found suitable econometric estimates of the elasticity of substitution, and adequate data for estimating trade shares (*see* Section 3.1.4 and Appendix C of the proposal EA).

For the proposed rule, EPA indirectly derived the price elasticity of U.S. demand for meat products regardless of the country of origin from the price elasticity of U.S. demand for meat products of U.S. origin (assumed to equal the U.S. domestic price elasticity of meat demand) using Armington's equations in repeated substitutions. In the revisions being considered by EPA, the Agency uses the U.S. domestic price elasticity of meat demand as a direct proxy for the price elasticity of U.S. demand for meat products regardless of the country of origin. This is more consistent with the econometric studies used to estimate the U.S. price elasticity of meat demand; such studies do not typically distinguish country of origin in measuring U.S. retail meat purchases. Details of EPA's derivation of trade elasticities may be found in the docket (DCN 125503).

Table VI.B.1 summarizes EPA's estimated trade elasticities under the methodology used for proposal and for the revised methodology described above.

TABLE VI.B.1.—ESTIMATES OF ARMINGTON TRADE ELASTICITIES FOR THE MPP MARKET MODEL

	Import elasticities [a]		Export elasticties [b]	
Meat type	Proposal [c]	Revised	Proposal	Revised
Beef	0.9588	1.9994	−1.5584	−1.5316
Pork	0.8519	1.3337	−1.5745	−1.5711
Broilers	0.8767	1.1458	−1.2017	−1.1903
Turkeys	0.7145	1.1600	−1.1865	−1.1557

[a] The percent change in U.S. demand for rest of the world (ROW) meat products resulting from a one percent change in U.S. price.
[b] The percent change in ROW demand for U.S. meat products resulting from a one percent change in U.S. price.
[c] In reviewing the trade elasticities used for proposal, EPA found an error in its calculation. Therefore the trade elasticities presented in this table differ from those used in the proposal economic impact analysis.

Based on the preferred option at the time of proposal (BAT 3), EPA compared trade impacts using the proposal elasticities and the revised elasticities. Annual imports were projected to be larger using the revised elasticities. Beef imports were 1.5 million pounds per year larger (a difference of 0.001 percent) under the revised elasticities; pork imports were about 280,000 pounds per year larger, while poultry imports were less than 20,000 pounds per year larger. Exports were slightly smaller using the revised elasticities. Beef exports were projected to be about 160,000 pounds per year smaller; the difference in pork and poultry exports was less than 100,000 pounds per year for each product. The difference in export projections is less than 0.006 percent of baseline. Revised estimates of market impacts including export and import quantities under the modified options using revised cost estimates are presented in Table X.A–7. EPA solicits comment on its revised trade elasticity methodology.

VII. Changes to EPA's Environmental Assessment

EPA received comments on the methodologies used to estimate MPP pollutant loadings and those used to estimate environmental benefits associated with the proposed regulatory options. At proposal, EPA based its estimates of monetary benefits of the rule on the suitability, as determined by concentrations of four specific water quality variables, of affected waters for a range of recreational uses (boating, fishing, and swimming). EPA employed the National Water Pollution Control Assessment Model (NWPCAM) version 1.1 to derive its benefit estimates. Ecological effects such as habitat degradation were noted but not quantified to avoid double-counting benefits derived using NWPCAM version 1.1.

Based on public comments received on the proposal and as discussed in the proposed rule, EPA is considering possible revisions to its approach as described in more detail below. Briefly, these revisions include (1) inclusion of nitrate and phosphate in the water quality variables modeled by NWPCAM to estimate the water quality index (WQI); (2) use of alternative or supplemental environmental models to more thoroughly characterize the environmental benefits of the regulation; (3) improvements to the algorithm relating changes in water quality to households' willingness to pay for improved water quality; and (4) consideration of other benefit categories (*e.g.,* reduced adverse human health effects from consuming fish and water contaminated by toxic compounds in MPP effluents; reduced costs of treatment associated with lower total suspended solids (TSS) loads in community water systems' (CWSs) intake water; reduced episodic fish kills resulting from discharges from MPP facilities; and a Regional Vulnerability Assessment (ReVA) that was designed to predict future environmental risk and support informed decision-making and prioritization of issues for risk management). EPA may consider other approaches for estimating benefits that are not specified in this NODA but may be a result of comments on today's notice. Note that revised results based on these methodological changes are not yet available, but will be placed in the record for this rulemaking as they become so. To the extent practicable, EPA will consider public comment on these results, even if filed after the comment period for the NODA, as it prepares the benefits analysis for the final rule.

A. Water Quality Modeling: What Changes and Information Are Being Considered?

1. National Water Pollution Control Assessment Model (NWPCAM)

EPA used NWPCAM version 1.1 to estimate environmental impacts to surface water quality resulting from implementation of the proposed rule. NWPCAM version 1.1 modeled instream concentrations of dissolved oxygen (DO), total Kjedahl nitrogen (TKN), biochemical oxygen demand (BOD), TSS, and fecal coliforms (FC). Four of these indicators (DO, BOD, TSS, and FC) were combined to generate a water quality index (WQI–4). The WQI is a 0 to 100 scale structured so that each water quality parameter is weighted to reflect its significance in determining the suitability of water for progressively more demanding uses. Changes in the WQI–4 were converted to monetary values based on a contingent valuation survey (Carson and Mitchell, 1993). Commenters remarked that this approach was an over-simplification because it may have ignored several other classes of pollutants discharged from MPP facilities including nitrogen (N) and phosphorous (P). For more details about valuation of water quality, see Section VII.B of this NODA.

NWPCAM version 1.1, used for the proposal, does not model nutrients discharged by MPP facilities. Since proposal, EPA has developed NWPCAM version 1.6 which simulates concentrations of the nutrients, nitrogen and phosphorus. Since the updated model addresses two additional components of wastewater discharges from MPP facilities, EPA is considering using the updated model to estimate the water quality change and the associated monetized benefits for the final MPP rule. Commenters also had concerns about the missing sources of loadings in the model, especially nonpoint and

minor point sources that were not captured in NWPCAM version 1.1. NWPCAM version 1.6 models water quality using a stream reach network with greater resolution and incorporates additional point and nonpoint source loadings.

The NWPCAM version 1.6 generates a water quality index (WQI–6) from six indicators of water quality (TSS, DO, BOD5, FC, nitrate (NO_3^-), and phosphate (PO_4^{3-})). The weights on individual water quality parameters are adjusted from WQI–4 to reflect the increased number of parameters in WQI–6. The new WQI–6 is a broader measure of water quality and is expected to provide a better representation of changes in water quality downstream of MPP facilities. A version of NWPCAM capable of simulating nitrogen and phosphorus concentrations and employing the WQI–6 is described in EPA, 2002.[1]

EPA solicits comment on the use of the six-parameter Water Quality Index (instead of the four-parameter Index) to assess the environmental improvements from revising the current MPP regulation. In particular, EPA solicits comment on the inclusion of nitrogen and phosphorous in the kinetics model.

EPA is considering the use of National Water-Quality Assessment Program (NAWQA) data to calibrate the baseline predicted by NWPCAM version 1.6 for the stream reaches associated with MPP facilities. EPA proposes to download NAWQA data for as many of the regions where MPP facilities are located as possible. Based on the comparison of NAWQA vs. NWPCAM version 1.6 data, EPA plans to estimate the prediction errors for each region using the NAWQA data and use the errors to adjust the NWPCAM results in each region. EPA then plans to generate a probability distribution for the errors for each parameter and then set up a Monte Carlo program to simulate variability in the water quality index as a function of NWPCAM uncertainty for all parameters at once. EPA solicits comment on the use of NAWQA data to calibrate the baseline, and solicits other sources of data to use in the calibration effort.

2. Site-Specific or Watershed-Specific Models

In order to more comprehensively simulate detailed water quality and aquatic ecosystem responses to MPP loadings and loading reductions, EPA is considering the use of other available models to evaluate the effects of nutrients and pollutants on receiving waterbodies from individual representative MPP facilities at a more site specific level either in lieu of or in addition to NWPCAM. In particular, the Agency is investigating the use of a simulation model for aquatic ecosystems (AQUATOX), an enhanced stream water quality model (QUAL2E), and the Better Assessment Science Integrating Point and Nonpoint Sources (BASINS) model. One advantage of using these models is their capacity to predict impacts of nutrient inputs on dissolved oxygen through eutrophication. Detailed information on each of these models can be found at *http://www.epa.gov/waterscience/wqm/*. Output from these candidate models could be used to qualitatively and quantitatively illustrate potential water quality and aquatic ecosystem responses to MPP loads and load reductions, or could be used in conjunction with environmental benefits valuation methods to estimate monetized benefits of MPP loads reductions. For example, water quality output from one or more of these models could be used as the basis for the calculation of the WQI–6 described above, and subsequent monetization. Alternatively, other output parameters from these models, such as levels of rough, forage, and game fish, could be used as the basis for other monetization approaches.

AQUATOX is an ecosystem model that estimates the environmental fate and effects of toxic chemicals, conventional pollutants, and nutrients from point and non-point sources on a stream-specific basis. In particular, AQUATOX allows assessors to model the fate of TSS, ammonia, nitrate, phosphate, carbon dioxide, DO, pH, temperature, light, and dissolved organic toxicants on the receiving waterbody. AQUATOX also provides an assessment of the impacts of these pollutants on assorted organisms (*e.g.,* phytoplankton, certain guilds and taxonomic groups of invertebrates and fish) and detrital components. AQUATOX can be used to investigate pollutant effects on streams, small rivers, ponds, and lakes. AQUATOX is relatively applicable to site-specific studies, models many conventional pollutants and nutrients, and estimates the impacts on a wide range of key aquatic ecosystem variables. Possible constraints of using AQUATOX to model the impacts and benefits from regulating the MPP industry are that (a) fairly detailed pollutant- and reach-specific parameters must be compiled to run the model, (b) it does not estimate BOD and FC (pollutants necessary for the water quality index (WQI) calculations) concentrations in the receiving waterbody, (c) AQUATOX is intended to represent a single stream or river reach or an entire pond, lake, reservoir, or estuary. A segmented version of AQUATOX, or multiple model runs, would be required to evaluate spatially variable conditions downstream of the immediate waterbody of interest if this were determined to be necessary.

QUAL2E simulates the in-stream behavior of toxic chemicals, conventional pollutants, and nutrients on a branching, one-dimensional stream-specific basis. In particular, QUAL2E models the concentrations of DO, BOD, temperature, algae, organic nitrogen, ammonia, nitrite, nitrate, organic phosphorus, dissolved phosphorus, FC, up to three conservative pollutants (pollutants that remain chemically unchanged in the water), and one non-conservative pollutant from point and non-point sources. QUAL2E allows a user to model up to 25 reaches on a river and 25 pollution sources along the river. Like AQUATOX, QUAL2E is relatively applicable to a site-specific analysis, and it also models many conventional pollutants and nutrients. Possible constraints of using QUAL2E to model the MPP industry are that (a) detailed pollutant- and reach-specific parameters must be compiled to run the model, (b) it does not estimate the TSS (a pollutant necessary for the WQI calculations) concentration in the receiving waterbody, and (c) it is only applicable for rivers, not lakes or estuaries.

BASINS is a multipurpose environmental analysis system that allows users to perform watershed- and water-quality based studies. This tool allows users to investigate river segments and how they may be impaired by point source and non-point source discharges. Databases available for use with BASINS provide necessary environmental background data, environmental monitoring data, and point source loading data. BASINS integrates the use of models such as QUAL2E, the Hydrological Simulation Program Fortran (HSPF) and Soil and Water Assessment Tool (SWAT) to conduct fate and transport assessments of point and non-point sources. BASINS models conventional pollutants and nutrients, including all the pollutants necessary to calculate a WQI, and (a) all the pollutant- and reach-specific parameters are available in the system's database files, (b) reach background concentrations for DO, ammonia, and BOD are available in the system's

[1] U.S. EPA (U.S. Environmental Protection Agency). Estimation of National Economic Benefits Using the National Water Pollution Control Assessment Model to Evaluate Regulatory Options for Concentrated Animal Feeding. December, 2002.

database files, and (c) it is applicable to rivers, estuaries, and lakes.

If site-specific models are used, EPA will not be able to model each regulated MPP facility receiving water or watershed separately due to various factors, including data requirements and time constraints. One potential scenario is to develop a limited number of ''generic'' watersheds that are representative of the topography and hydrology of the areas in which MPP facilities are located. Load reduction scenarios for each of the facilities with detailed information would then be evaluated for water quality improvements using the ''generic'' watershed which best represents the geography and flow conditions of the discharging facility. Another option being considered is to model a small sample of the watershed or reach areas containing MPP facilities and extrapolate results to a broader number of areas (see Section VII.B.2 of this NODA).

In determining which of these candidate models to pursue, EPA will weigh resource requirements for each model, the availability of data required to run each model, and the contribution of the endpoints simulated by each model toward best representing the range of environmental impacts and benefits of regulation. If EPA uses one or more of these models for the final rule, EPA will use the revised final loadings estimates along with information on facility location within watersheds. A comparison of the advantages and disadvantages of all three models is provided in Table VII.A.2–1. EPA solicits comment on the applicability of the AQUATOX, QUAL2E and BASINS models to model the environmental benefits of the MPP regulation.

TABLE VII.A.2–1.—SUMMARY OF THE FEATURES OF AQUATOX, QUAL2E, AND BASINS

AQUATOX	QUAL2E	BASINS
Conventional and nutrient loadings assessed	Conventional and nutrient loadings assessed	Conventional (including DO, BOD, TSS, FC) and nutrient loadings assessed
Eciststen effects (effects on fish and other aquatic life) estimated	Requires specific data about reach and pollutant parameters	Includes background levels for DO_3, NH_3, and BOD
Requires specific data about reach and pollutant parameters	Does not model TSS; Only models rivers, no estuaries or lakes	Reach and pollutant data easily available from BASINS databases
Does not model BOD, FC; Multiple model runs required to model effect of pollutants downstream from reach	Peer reviewed/available to public	Models rivers, estuaries, and lakes
Peer reviewed/available to public		Peer reviewed/available to public

B. Recreational Benefits: What Changes and Information Are Being Considered?

The benefits analysis for the proposed rule used two methods to estimate a household's willingness to pay for improvements in water quality: (1) A water quality ladder; and (2) a continuous water quality index. Both methods are based on results from a stated-preference survey conducted by Mitchell and Carson (1993).[2] Previous applications of the Mitchell and Carson survey had focused on the household willingness to pay for ''stepped'' improvements in water quality from current levels to boatable, fishable, and swimmable conditions nationwide. Each step on the ladder, *i.e.* use level, was defined by a set of water quality indicators such that a water body must meet minimal criteria for every indicator to be classified into the next higher use class. Thus, the stepped willingness to pay could only indicate a benefit from an action that resulted in all water quality indicators satisfying the next higher use category. The ladder approach failed to attribute any benefits to improvements in water quality that were insufficient to actually achieve a discrete improvement in use. Conversely, a relatively small change in water-quality could receive a relatively large valuation if it happened to push water-quality over the threshold between steps. A ''continuous'' method was suggested by Mitchell and Carson (1993) as a means to attribute benefits to marginal water quality improvement whether or not it happened to be of sufficient improvement to result in reclassification to a higher use class. The benefits analysis of the proposed MPP regulation presented both methods in order to contrast their results.

The ''continuous'' method of monetizing water quality benefits from WQI changes used in the analysis of the proposed rule was further revised in the benefit assessment of the final effluent limitation guidelines for CAFO. This revision included the application of a benefit transfer function from the Mitchell and Carson survey. Mitchell and Carson expressed the results of their survey in several forms. In one format, Mitchell and Carson assigned a single value to each change in use class, *e.g.*, households were willing to pay $184 (1999 dollars; updated household income) to raise all of the nation's waters from boatable to fishable conditions. The continuous benefit analysis of the MPP proposed rule divided this value by the number of WQI points in the step so that each unit change was assigned a portion of the value for achieving the whole step. For example, assume the threshold WQI for boatable waters was 79 and the threshold for the next higher step, fishable waters, was 94.4. Dividing $184 by 15.4 WQI points in the boatable range allocates $11.91 to each WQI point gained. Thus, household willingness to pay for a three point improvement in WQI in this range would be $35.73 (=3×11.91). Mitchell and Carson also expressed their results as an equation relating the change in the water quality index and household income to the household's willingness to pay for improved water quality. For the final rule, EPA is considering using this function to value benefits based on the changes in the WQI. The continuous equation approach may be superior to the ladder approach in that it addresses concerns that benefits from marginal changes in the water quality are missed using the discrete ladder. And the Mitchell-Carson benefit function approach may be superior to the WQI approach used at proposal in that it is less sensitive to the baseline use of the waterbody. In contrast, the WQI

[2] Carson, Richard T. and Robert C. Mitchell. 1993. The Value of Clean Water: The Public's Willingness to Pay for Boatable, Fishable, and Swimmable Quality Water. Water Resources Research 29(7):2445–2454.

approach used at proposal applies values to water quality index changes that are more consistent with expected levels of use as predicted by NWPCAM results and the threshold criteria in the ladder. The valuation function from the Mitchell and Carson work also demonstrates consistency with economic theory in that it exhibits a declining marginal willingness to pay for water quality. However, the ladder approach captures the discrete changes in uses presented to respondents in the survey instrument used to collect the underlying valuation data. While EPA recognizes that caution must be used in manipulating valuations derived from stated preference surveys, EPA believes the WQI–6 and the Mitchell-Carson valuation function may help address some concerns associated with the NWPCAM monetization of benefits at proposal. Both of these enhancements were incorporated in NWPCAM version 1.6 used to analyze benefits for the final CAFO rulemaking (DCN 350510).

Since willingness-to-pay (WTP) for water quality improvements was assessed by Mitchell-Carson only at a national level (*i.e.*, ''How much would you pay to bring all freshwaters in the U.S. from boatable up to swimmable?''), NWPCAM needs a methodology for assigning a share of this WTP to individual water bodies that may benefit from the rule. Generally, EPA assigns this share proportioned based on the ratio of affected stream miles to total stream miles. In doing this EPA allocates two thirds of willingness to pay to water quality improvements that occur in state. It is reasonable to assume that individuals will have greater marginal values for water quality improvements that occur in state, and Carson and Mitchell results appear to support this assumption. The consequences of alternative assumptions, such as equal marginal willingness to pay for in state and out of state water quality improvements, on final benefit estimates is a function of relative populations and ratios of population to total stream miles for states with and without stream reaches affected by this rule. For the final rule, EPA is considering conducting a sensitivity analysis to determine the impacts of these assumptions on the monetized benefits estimates.

EPA solicits comment on the use of Mitchell and Carson's valuation function for estimating the monetized benefit for the MPP industry. If more site-specific valuation information becomes available, EPA may decide to incorporate those site-specific values for estimating the monetized benefit.

C. Toxicity Assessment: What Changes and Information Are Being Considered?

Commenters also raised concerns over pollutants of concern (POCs) that were not addressed in the proposal. Based on these comments, EPA has performed exploratory analysis employing stream dilution modeling techniques, which do not take into account fate processes other than complete immediate mixing, to assess the potential impacts of releases of ten pollutants (ammonia, barium, chromium, copper, manganese, molybdenum, nickel, titanium, vanadium, and zinc) from the 53detailed survey MPP facilities for which sufficient data were available to model. These 53 facilities directly discharge wastewaters to 53 receiving streams. These simplified stream dilution techniques have been used in other promulgated effluent guidelines such as Iron and Steel, Metal Products and Machinery, and Transportation Equipment Cleaning.

Using this approach, EPA assessed the potential impacts in terms of effects on aquatic life and human health. The impacts to aquatic life are projected by comparing the modeled instream pollutant concentrations under current (baseline) treatment levels, to published EPA aquatic life criteria guidance [3] or, for pollutants for which no water quality criteria have been developed, to toxic effect levels (*i.e.*, lowest reported or estimated concentration that is toxic to aquatic life).

Impacts to human health are projected by (1) comparing estimated instream pollutant concentrations to health-based toxic effect values or criteria, and (2) estimating the potential reductions of noncarcinogenic (systemic adverse effects such as reproductive toxicity) hazard from consuming contaminated fish and drinking water. Systemic hazards are evaluated for the general population (drinking water only), sport anglers and their families, and subsistence anglers and their families. Potential carcinogenic risks are not evaluated since none of the pollutants modeled are classified by EPA as known or probable carcinogens.

EPA projects that modeled instream pollutant concentrations of one pollutant (copper) will slightly exceed (1.03 ratio) chronic aquatic life criteria or toxic effects levels in only 1 of the 53 receiving streams at current discharge levels. No exceedences of acute aquatic life criteria or toxic effect levels are projected. In addition, EPA projects that one pollutant (manganese) will marginally exceed (1.2 ratio) human health criteria or toxic effect levels in 1 of the receiving streams. No systemic toxicant effects are projected for anglers consuming fish caught from any of the receiving streams at current discharge levels. Based on these results, EPA projects that there are no meaningful health or aquatic life benefits to be obtained as a result of the selected BPT or BAT options and no further analyses of these types of impacts are being considered.

D. Other Benefits Categories Being Considered

1. Drinking Water Treatment

Suspended solids can interfere with effective drinking water treatment. Specifically, high sediment concentrations that interfere with coagulation, filtration, and disinfection increase treatment costs. With more than 11,000 public drinking water systems throughout the United States relying on surface waters as a primary source, these costs can be substantial, though at most only a small fraction of these systems could be impacted by MPP facilities.

For the final rule, EPA is considering estimating the monetary value associated with the estimated reductions in TSS stream concentrations in terms of reduced drinking water treatment costs. This is done by relating the changes in TSS concentrations predicted by NWPCAM with the operational and maintenance (O&M) costs associated with the conventional treatment technique of gravity filtration at the drinking water treatment facility. These estimated cost reductions may be subject to a number of uncertainties, such as the use of average input values and default treatment design values, resulting in a rough approximation of estimated benefits.

The analytic approach being considered includes: (1) Identifying public drinking water systems and their water supplies that are potentially impacted by the discharge from MPP facilities; (2) linking the water supplies to the TSS concentrations predicted by NWPCAM at baseline and the various

[3] In performing this analysis, EPA uses guidance documents published by EPA that recommend numeric human health and aquatic life water quality criteria for numerous pollutants. States often consult these guidance documents when adopting water quality criteria as part of their water quality standards. The simplified stream dilution techniques are used as a screening analysis for priority pollutants and hence EPA uses the national criteria values in lieu of more site specific values. It is not intended as a comprehensive analysis, but rather as a trigger for potential impacts in terms of effects on aquatic life and human health. A more site-specific analysis could be undertaken if the simplified stream dilution technique projected in-stream exceedences of national aquatic life and human health criteria.

regulatory options; and (3) estimating the reductions in drinking water treatment costs.

a. Identification of Public Drinking Water Systems

Information regarding public water systems is contained in the Safe Drinking Water Information System (SDWIS)[4] Database. There are 11,403 Community Water Systems (CWSs supply water to the same population year-round) that rely on surface water to serve 178.1 million people. The water supplies of a small number of these CWSs may be impacted by the discharge from MPP facilities. The first step in the approach that EPA is considering is identifying the subset relevant to the MPP rule of CWSs and their associated streams, the populations served, and operating status. This will be performed using two EPA databases: (1) Water Supply Database (WSDB)[5] and (2) SDWIS. Hydrologic locational information will be obtained from WSDB, and populations served by the drinking water systems, as well as operating status, will be obtained from SDWIS.

b. Application of TSS Concentrations and Water System Data

To estimate reduced drinking water treatment costs associated with TSS reductions, EPA will link the site-specific water system data from WSDB and SDWIS with NWPCAM predicted TSS concentration reductions at baseline and the various regulatory options (*see* Section VII.A. for discussion of water quality modeling). The median concentrations of TSS predicted by NWPCAM will be applied to each of the public water utilities located within the watershed. EPA may consider using site-specific TSS concentrations (*i.e.*, the concentration at the drinking water intake) for the final rule. EPA is currently working to determine if the appropriate data are available. EPA solicits comment on the use of site-specific TSS concentrations for estimating reduced drinking water treatment costs.

c. Estimation of Drinking Water Treatment Costs

EPA is considering employing the Water Treatment Estimation Routine (WaTER),[6] developed in a cooperative effort between the U.S. Department of the Interior, Bureau of Reclamation, and the National Institute of Standards and Technology, to estimate reduced drinking water treatment costs based on projected reductions in TSS stream concentrations. Using minimal information such as production capacity and raw water composition, WaTER calculates dose rates and cost estimates (construction and annual O&M) for 15 standard water treatment processes, based on default design values. These default design values can be modified, based on the users specific requirements. WaTER employs cost indices and the Producer Price Index and derives cost data from Estimating Water Treatment Costs (EPA–600/2–79–162a–d, 1979).[7] Cost estimates are derived independently for each selected process.

EPA is considering using WaTER to estimate reduced O&M costs for the standard water treatment process of gravity filtration, based on the capacities of drinking water treatment utilities and the estimated TSS stream concentration reductions. There are two components to gravity filtration: the backwashing system and the gravity filter structure. O&M costs are based on the area of the filter bed (applicable range 13–2600m^2) as determined by the system flow rate (production capacity) and TSS concentration. Major O&M costs include materials, energy, and labor. Off-site disposal costs and pretreatment costs, as well as construction costs, will not be included in EPA's estimates. Cost saving estimates will be derived based on the change in O&M costs predicted at baseline and the regulatory options.

EPA solicits comment on this approach to estimating monetized benefits associated with reduced TSS concentrations predicted by NWPCAM at drinking water intakes.

2. Fish Kills

Episodic fish kills resulting from nutrients, animal waste spills and other discharges from MPP facilities have been documented in the Mid-West, and South as well as along the East Coast. Causes for the fish kills included increase in the pH, toxic amounts of ammonia and chlorine, nutrients and fecal coliforms (*see* Section 20.4.2, DCN 145010). In the case of excessive nitrogen and phosphorous discharges, these pollutants can trigger increases in algae growth that reduce the concentration of dissolved oxygen in water and can eventually cause fish to die.

In addition to killing and harming fish directly, pollution from MPP facilities can affect other aquatic organisms that in turn harm fish. In particular, the Eastern Shore of the United States has been plagued with problems related to *Pfiesteria,* a dinoflagellate algae that, under certain circumstances, can transform into a toxic form that stuns fish, making them lethargic. Other toxins are believed to break down their fish skin tissue and leave lesions or large gaping holes that often result in death. One reason for the transformation of *Pfiesteria* to its toxic form is believed to be high levels of nutrients in water (Morrison, 1997).[8] EPA is gathering evidence on documented fish kills resulting from discharges from MPP facilities. EPA may either use this estimate of fish kills in its non-quantified benefits assessment, or use it to derive a lower bound quantified estimate of fish kills attributed to MPP facilities as part of the benefits analysis for the final rule. EPA requests information on documented fish kills resulting from MPP discharges and comment on the use of this information in its benefits assessment.

3. Regional Vulnerability Assessment

The Office of Research and Development within EPA is developing the Regional Vulnerability Assessment (ReVA) program to evaluate environmental conditions and known pollutants/stressors within a geographic region. Detailed information about ReVA can be found at *http://www.epa.gov/reva/about.htm.* ReVA's purpose is to identify those ecosystems most vulnerable to being lost or permanently harmed in the next 5 to 25 years and to determine which pollutants/stressors are likely to cause the greatest risk. The goal of ReVA is not exact predictions, but identification of the types of undesirable environmental changes most likely to occur over the coming years. The ReVA program will improve environmental assessments for a region by using integrative technologies to predict future environmental risk and support informed, proactive decision-making and prioritization of issues for risk management. Detailed information on

[4] U.S. EPA (U.S. Environmental Protection Agency). 2000a. Safe Drinking Water Information System (SDWIS). Office of Groundwater and Drinking Water. Accessed September 2002. *www.epa.gov/safewater/pws/factoids.html.*

[5] U.S. EPA (U.S. Environmental Protection Agency). 2000b. Water Supply Database. Office of Water. Downloaded February 2000.

[6] U.S. Bureau of Reclamation. 1999. Water Treatment Estimation Routine (WaTER). Denver, Colorado. U.S. Department of the Interior. August 1999. Accessed September 2002. *http://www.usbr.gov/water/desal.html.*

[7] U.S. EPA (U.S. Environmental Protection Agency). 1979. Estimating Water Treatment Costs. EPA–600/2–79–162a–d. August 1979.

[8] Morrison, C. 1997. ''The Cell from Hell and Poultry Farmers: Do They Have Anything in Common?'' The Shore Journal. August 31.

this program can be found at *http://www.epa.gov/reva.*

ReVA is a tool for integrating research on human and environmental health, ecorestoration, landscape analysis, regional exposure and process modeling, problem formulation, and ecological risk guidelines. ReVA develops landscape models that predict probability of impairment for individual watersheds given land use and biophysical characteristics. ReVA is able to explore hierarchical modeling (broad scale, landscape models combined with fine-scale watershed models) and grouping of watersheds to assess benefits associated with proposed alternative effluent standards against a backdrop of existing non-point source pollution and naturally occurring conditions that influence watershed vulnerability. EPA may consider using the output from the ReVA program as an additional source of information characterizing the environmental impacts and potential benefits of MPP facilities. EPA solicits comment on the use of a regional vulnerability assessment for the MPP environmental assessment.

VIII. Possible Changes to the Proposed Limitations and Standards

This section describes EPA's plans for revising the proposed limitations and standards before the final rule. The NODA record contains episode-level summary statistics, including the episode long-term averages and episode variability factors. (In this context, ''episode'' refers to either an EPA sampling episode data set or an industry-submitted self-monitoring data set.) After EPA completes its statistical and engineering review of the episode summary statistics and other available information, it will select episode data sets that reflect the appropriate performance capabilities of the model technologies for each option. EPA then will use these episode data sets to calculate the option long-term average as the median of the selected episode long-term averages, and the option variability factor as the mean of the selected episode variability factors. The final limitation/standard will be calculated as the product of the option long-term average and option variability factor, as explained in Sections 13.8 and 13.9 of the proposal technical development document.

Because EPA has not performed its review of the episode data sets, the NODA record does not include option long-term averages, option variability factors, and limitations/standards. Instead, the following discussion provides an overview of EPA's plans for reviewing the episode data sets and revising the proposed limitations and standards. The first subsection, VIII.A, discusses the revisions to the statistical methodology used to develop the limitations/standards and loadings. The second subsection, VIII.B, describes EPA's consideration of comments on the assumed monitoring frequency used to develop the proposed limitations and standards (and for deriving costs for complying with the proposed rule). The third subsection, VIII.C, describes EPA's plans for reviewing the data that will be used to develop the final limitations and standards. The fourth subsection, VIII.D, describes EPA's planned review of the variability factors that EPA expects to use to derive the final limitations and standards. The fifth subsection, VIII.E, describes EPA's plans for assessing the achievability of the limitations and standards it is considering promulgating. The final subsection, VIII.F, describes EPA's preliminary identification of errors in 40 CFR part 432 and the recodification included in the proposed rule.

A. Revision of Statistical Methodology for Long-Term Averages and Loadings

In the proposal, EPA used the data from 11 MPP sampling episodes to develop the proposed long-term average effluent concentrations, variability factors, limitations/standards, and loadings. Since then, EPA has completed three additional MPP sampling episodes which operate some of the technologies considered as a basis of the limitations and standards. Two of the additional sampling episodes were at facilities that had been sampled prior to proposal. EPA also has received self-monitoring data from 16 of the 24 MPP facilities from which EPA requested data, as discussed in Section II.B above. The following two sections briefly discuss EPA's methodology at proposal and the revised methodology EPA is considering for calculating limitations/standards and the loadings associated with the various technology options.

1. Estimation of Daily Values and Long-Term Averages in the Proposal

For the proposal, to the extent possible with available data, EPA calculated the limitations/standards and technology option loadings using the measured daily effluent concentrations at the sampled facilities that were chosen as the basis for each technology option. However, when effluent data were unavailable from a particular model technology, EPA estimated the daily effluent concentrations by combining influent data with removal fractions from facilities with components of the model technology. When influent data were not available, EPA estimated the daily effluent concentrations using a facility pollutant mass balance between the final effluents from wastewaters from different processes (*e.g.,* first processing, rendering), as explained in Section 9.2.2 of the proposal development document. As explained in Section 13 of the proposal development document, EPA also adjusted several estimated concentration values upward to be more consistent with documented performance values for the technology or actual effluent concentrations.

To derive the proposed limitations and standards, EPA then modeled the combined measured and estimated effluent data using the modified delta-lognormal distribution to estimate the long-term averages and variability factors. After reviewing the estimated long-term averages used in calculating limitations, EPA determined that substitutions were necessary and appropriate. Sections 9 and 13 of the proposal development document describe the substitutions.

2. Revised Approach

EPA has revised its data selection to incorporate the new data from sampling episodes and DMRs (*i.e.,* individual weekly/daily data points, not summary data). As a consequence of the new data and the comments that it received, EPA intends to use only measured effluent values rather than estimated values in developing the final limitations/standards and loadings. DCNs 165011 and 165140 provides listing of the data that EPA is considering using to calculate the final limitations and standards. For today's NODA, because of time constraints, EPA has used the arithmetic average of the data in calculating the target effluent concentrations used for developing costs and loadings. For the final rule, EPA intends to use the modified delta-lognormal distribution to model the data, and thus, the long term average values will be similar but somewhat different than the target effluent concentrations presented today. Also, EPA plans to use the daily/weekly data, rather than the summary DMR data used today. This delta-lognormal distribution was used for the proposal and is described in Appendix G of the proposal development document. *See* Section VIII.D for EPA's plan for reviewing variability factors to be used for the final rule.

For the two facilities that EPA sampled twice (*i.e.,* once prior to proposal and once after proposal), EPA's initial assessment is that the post-

proposal sampling episode at each facility provides a better demonstration of the model technology, and has included only the post-proposal episode in the NODA analyses. For the proposal, EPA had excluded one of the pre-proposal episodes (6446) and included the other pre-proposal episode (6335) in its analyses. For episode 6446, EPA continues to exclude these data due to concerns that the facility had with the results of its self-sampling (*see* DCN 15169) in comparison to EPA's sampling episode results. For episode 6335, EPA had now excluded these data due to a combination of inconsistent laboratory results for nitrogen and operational issues at the facility during the sampling episode (*see* DCN 00211). For several POCs both of these pre-proposal episodes showed higher effluent concentrations than the post-proposal episodes at the same facility. However, for Total Nitrogen, which EPA is considering regulating in the final rule, these pre-proposal episodes showed lower effluent concentrations than the post-proposal episodes at the same facility. EPA solicits comment on the use of data from Episodes 6446 and 6335 for use in developing pollutant loading estimates and limitations and standards for the final rule.

B. Consideration of Assumed Monitoring Frequency

In developing the proposed maximum monthly limitations and standards, EPA had assumed a monitoring frequency of thirty samples per month (*i.e.,* daily monitoring). In the preamble (67 FR 8632), EPA solicited comment on whether small poultry facilities should have monthly limitations/standards based upon 20 days, rather than 30 days, because they would be unlikely to operate on weekends. In response, EPA received comments that stated that monitoring every day during the month was too frequent for all facilities. In response, EPA is considering reducing the assumed monitoring frequency to weekly for any new limitations and standards promulgated in this rulemaking. EPA incorporated this assumed monitoring frequency into the monitoring costs for this notice. EPA solicits comment on such a change in monitoring frequency.

The comments indicate some confusion may exist about the assumed monitoring frequency used to develop the existing limitations and standards. In the 1975 rule, the monthly limitations and standards specified that the ''Average of daily values for thirty consecutive days shall not exceed'' the stated value. Thus, EPA assumes that facilities perform daily monitoring to comply with the existing regulations. As stated by commenters, the monitoring frequency has an effect on the probability of exceedences. Thus, a facility should monitor at the same frequency that EPA has assumed in developing the limitations and standards. Monitoring less frequently results, theoretically, in average values that are more variable. As a consequence, for example, a facility that collects four monitoring samples per month would be likely to exceed, at a relatively high rate, the monthly average limitations based upon an assumed monitoring frequency of 30 monitoring samples per month. Thus, if facilities monitor less frequently, then operators may find they need to design treatment systems to achieve an average below the long term average basis of the limitations/standards and/or exert more control over variability of the discharges in order to maintain compliance with the limitations/standards.

C. Data Review for Final Limitations and Standards

While EPA has preliminarily reviewed the analytical data for the NODA, EPA will conduct a more detailed engineering and statistical review of the data before the final rule, similar to that performed for other rules. The following paragraphs identify specific data reviews that EPA typically performs before promulgating a final rule.

For all pollutants that might be regulated in the final rule, EPA plans an engineering review of its data to verify that the limitations and standards are reasonable based upon the design and expected operation of the control technologies and the facility process conditions. As part of that review, EPA plans to examine the range of performance represented by the episode data sets with the model technology. EPA expects that some episode data sets will demonstrate application of the best available technology and report an effluent quality that would meeting the limitations EPA is considering. Other episode data sets may demonstrate performance from the same types of technology, but not reflect the best design and/or operating conditions for that technology. For these facilities, EPA will evaluate the degree to which the facility can upgrade its design, operating, and maintenance conditions to meet the limitations or standards EPA is considering. If such upgrades are not possible, then the limitations and standards associated with the candidate technology would be modified to reflect the lowest levels that the technology can reasonably be expected to reliably and consistently achieve. If some individual values are greater than the limitations and standards EPA is considering, EPA expects to consider whether the facility can eliminate those comparatively high values and achieve the limitations under consideration through optimization and improved operation of the treatment system. If so, EPA might conclude that the limitations adequately reflect the treatment capabilities of the model technologies. In such cases, EPA expects to adjust its cost estimates for the facility to cover any upgrades and improved O&M necessary to reliably and consistently meet the limitations. *See* Section 13.6 of the proposal development document for further explanation.

As part of its engineering and statistical review of the data, EPA intends to review the sampling episode and industry self-monitoring data for consistency and any unusual patterns (such as all values being the same over a period of time which can indicate nondetected values rather than measured values, lack of sensitivity in the laboratory procedures, or other causes). EPA also intends to evaluate discrepancies between concentrations for related pollutant parameters. For example, because CBOD theoretically should be less than BOD, EPA might investigate CBOD values that exceeded BOD values to determine whether any data exclusions are appropriate. In addition, EPA plans to reevaluate the engineering and statistical reasons for excluding any data that otherwise meet the data review criteria used to assess laboratory reports. These data review criteria are used consistently for each guideline and are located at DCN 165330 in Section 22.6 in the record. EPA also will verify that it has fully documented its reasons for excluding any data that otherwise meet the data review criteria for the laboratory reports, for example the data from Episodes 6446 and 6335, as discussed in Section VIII.A.

EPA intends to review field duplicates and multiple grab measurements and investigate extreme discrepancies between values for samples collected on the same day. The measurements for the field duplicates and grab samples are listed in DCNs 165020 and 165030. EPA also intends to review summary statistics for each episode (*see* DCNs 165070 and 165150). EPA may further review episodes with patterns such as minimum and maximum values far apart. If some episodes appear to have data in ranges different from most other episodes in the same subcategory, EPA may perform additional engineering evaluation of the

process conditions and treatment performance. For example, if one facility has substantially more concentrated effluent than the others, a detailed engineering review might reveal conditions that would justify excluding the less concentrated effluent data from other facilities from the calculations of limits.

For the larger self-monitoring data sets, EPA intends to review graphical displays of the daily measurements to evaluate patterns in the data, such as steadily increasing or decreasing values over time or during certain time intervals. The plots may also indicate data values that should be reviewed further and possibly excluded if they appear to reflect conditions other than normal operations. For example, EPA might exclude a value which was substantially lower than the other measurements if an extremely high flow value was recorded for that day.

Where both influent and effluent are available for an episode, EPA intends to investigate the impact on the performance of the technology due to the influent levels. In this investigation, EPA might evaluate whether the influent concentrations are at treatable levels and whether the treatment system had efficient removal capability. For the proposal, this treatable level was defined as five times the nominal quantitation limit that generally was associated with the analytical method most frequently used to measure samples collected during EPA's sampling episodes. (The nominal quantitation limit is the smallest quantity of an analyte that can be reliably measured with a particular method. The record items for the proposal generally refer to the ''nominal quantitation limit'' as the ''baseline value.'') If the influent data were below the treatable level or just slightly above, EPA may exclude the effluent data from the analyses for the final limitations and standards. EPA's purpose in excluding these effluent data sets would be to ensure that the effluent concentrations resulted from treatment and not simply from the absence or extremely low levels of that pollutant passing through a treatment system.

For most facilities in the MPP concentration database, EPA has data from either a sampling episode or the facility's self-monitoring (DMR) data. However, for a few facilities, EPA has data from both a sampling episode and self-monitoring data. The statistical analyses for the NODA treat each sample episode and self-monitoring data set separately. For example, if EPA had sampling episode and self-monitoring data sets for a facility, it would have calculated two long-term averages from the facility's data, one from the sampling episode data set and the other from the self-monitoring data set. This practice is consistent with other guidelines and is used because the data tend to be associated with different time periods and/or analytical methods. For any facilities with EPA sampling data and self-monitoring data for the same time period, EPA intends to evaluate whether the data should be combined into a single data set or continue to be analyzed as two separate data sets for the final rule. For facilities that submitted self-monitoring data over an extended period, if there are substantial differences between certain time intervals, EPA intends to reevaluate whether each time interval should be treated separately in the data analyses.

In its review of the self-monitoring data, EPA will verify that the concentrations were determined by an analytical method approved for compliance monitoring in 40 CFR part 136. If the facility has identified a different method, EPA may decide to contact the facility for more information about the laboratory analysis to determine if the results would be comparable to those generated by approved methods. It is likely that EPA would need to perform a full review of the laboratory reports such as initial precision and recovery (IPR) analyses, instrument tunes, calibrations, blanks, laboratory control sample (LCS) analyses, matrix spikes, surrogates, and all sample data. Without the necessary information, EPA may choose to exclude measurements from non-approved analytical methods.

D. Evaluation of Final Variability Factors

As explained in the introduction to Section VIII, the NODA record does not include the option-level variability factors used to calculate limitations/standards. For the final rule, EPA intends to use the same data and methodology described in Section VIII.A. The section below describes EPA's plans for reviewing and possibly transferring option-level variability factors for the final limitations and standards.

To identify situations producing unexpected results, EPA reviews all of the episode variability factors and compares daily to monthly variability factors. One criterion is that the daily and monthly variability factors should be greater than 1.0. A variability factor less than 1.0 would result in a unexpected situation where the estimated 99th percentile would be less than the long-term average. A second criterion is that the daily variability factor should be greater than the monthly variability factor so that the daily limitation will be numerically greater than the monthly average limitation. A third criterion is that not all of the measured (non-censored) results can be below the sample-specific detection limits. While such data sets can be modeled using statistical techniques, the results can be difficult to interpret because the model is generally used for data sets where non-censored values are expected to be larger than non-detected values. A fourth criterion relates to the reasonableness of calculated variability factors. For example, EPA may further evaluate data sets for daily variability factors less than 1.1 and above 7 to determine if any anomalies existed in the data. As a result of this review, EPA may determine that a variability factor does not represent a reasonableness range of variation from well-operated systems, but rather may indicate a situation where better process control is needed. Any reduction in variability factors based on tighter operational control would also be reflected in higher cost estimates to achieve this control if necessary.

For some subcategories, EPA may be unable to calculate variability factors. This could occur for a pollutant in an option where the episode data sets had too few noncensored measurements (*e.g.,* the pollutant was not detected at measurable levels) or no data were available. For example, if a pollutant had all nondetected values for all of the episodes in an option, then it would not be possible to calculate the variability factors for that option. In such cases, EPA will transfer the variability factors from other options, subcategories and/or similar pollutants as appropriate.

E. Evaluation of Achievability of Final Limitations and Standards

If a facility operates the model technology for an option to achieve the relevant long-term average, EPA expects that the facility will be able to reliably and consistently comply with the limitations EPA may promulgate. Because EPA's option variability factors account for reasonable excursions above the option long-term average, the limitations promulgated by EPA are intended to correspond to levels (above the actual long-term averages) that well-operated systems can reliably and consistently achieve. In order to meet the monthly average limitation, a facility would need to counterbalance a value near the daily maximum limitation with one or more values well below the daily maximum limitation.

EPA recognizes the importance of promulgating achievable limitations; thus, as described in this section, EPA intends to perform a series of steps to compare the available data and information to the limitations and standards. The following paragraphs describe those steps.

First, EPA intends to perform statistical reviews of the data and its statistical model. In this step, EPA intends to compare the limitations and standards to the data used to calculate the limitations and standards. EPA performs this comparison to determine whether it used appropriate distributional assumptions for the data used to develop the limitations and standards (*i.e.,* whether the curves EPA used provide a reasonable ''fit'' to the actual effluent data). This comparison should not be interpreted to mean that EPA expects values that exceed the limitations to occur at some fixed rate. Furthermore, because EPA has used data from facilities that were not required to comply with the final limitations at the time the data were collected, the observed data cannot be interpreted as supporting estimates of compliance rates. Rather, in conjunction with the engineering review (step 2 below), the results from this step allow EPA to determine if it has used reasonable statistical assumptions in developing the limitations. This is also explained in Section 13.6 of the proposal development document.

Second, EPA intends to perform a detailed engineering evaluation of the data and facilities used as a basis for the final limitations and standards. For facilities with higher or consistently lower discharges than the option long-term averages used to calculate the limitations/standards, EPA will verify that the facilities have the relevant treatment technology and are operating it appropriately. For example, upon contacting a facility with considerably less concentrated discharges, EPA may discover that the facility has a component in its treatment train that is not part of the model technology. In such a situation, EPA would be likely to exclude the facility's data from its final calculation of the limitations and standards, because the facility's treatment capabilities are better than the model technology. For facilities with more concentrated discharges that are operating the model technology, EPA may determine that such values can be eliminated through improved operation of the treatment system. In such cases, EPA may adjust its cost estimates for the facility for any upgrades and improved operations and maintenance (O&M) necessary to reliably and consistently meet the final limitations/standards. As part of the engineering evaluation, EPA also will investigate excessive variations that could indicate exceptional incidents or upsets that are not typical of good performance. Based on thorough technical review of the data, EPA may exclude data that do not represent proper process operations or treatment control and would adjust its cost estimates appropriately. For the final rule, the record will clearly state which, if any, data points were excluded and the rationale for the exclusion.

Third, in some cases, EPA calculated the arithmetic average of the concentration values from two or more samples to obtain a single daily value that could be used in other calculations. EPA's approach of averaging multiple analytical results to obtain a single daily value is consistent with standard, conventional practice in environmental analytical work. This approach also gives one day's sampling information appropriate weight in determining effluent limitations and is consistent with requirements of NPDES regulations at 40 CFR part 122 which define the daily discharge. Multiple daily values resulted from measurements of field duplicates and grab samples during EPA sampling episodes. As explained in Section 13 of the proposal technical development document, field duplicates are two samples collected for the same sampling point at the same time, and thus, characterize the same conditions at that time at a single sampling point. Also as explained in Section 13, EPA collected multiple (usually four) grab samples for HEM during a sampling day at a sample point, because Method 1664 requires that grab samples rather than composite samples be used in the laboratory analysis. For the final rule, EPA will continue to model daily values in calculating the limitations and standards. EPA also intends to: (1) review the individual measurements from field duplicate pairs and individual grab samples; and (2) compare the individual measurements to the final limitations and standards. If EPA finds extreme discrepancies, EPA may reevaluate its data aggregation procedure (*i.e.,* arithmetic averaging) or data selection used to develop the final limitations and standards.

Fourth, EPA intends to compare the limitations and standards to other EPA sampling data that were not used as a basis of the limitations and standards. For example, EPA would expect that a more sophisticated treatment system would result in effluent concentrations that have lower concentration values than the limitations based upon the less sophisticated, model technology. If EPA notes a different trend, it may perform a more detailed engineering review of the treatment technologies and data selection.

Fifth, EPA intends to verify that 40 CFR part 136 contains approved analytical methods that will be appropriate for compliance monitoring with the final limitations and standards. If EPA determines that the limitations are based upon data from some laboratories that, under certain conditions, had measured to levels lower than the nominal quantitation limits specified in some methods, EPA will evaluate whether those results are quantitatively reliable. In some cases, EPA may discover, for example, that the laboratory had used an approved technique that can reliably measure lower levels, but might not be commonly used. If EPA concludes that the results are quantitatively reliable, it will continue to use the data to calculate loadings, long-term averages and variability factors. To ensure the final limitations and standards reflect ''typical'' laboratory reporting levels for approved methods, EPA may choose to establish the option long-term averages or limitations at values equal to or greater than the nominal quantitation limits specified in the analytical methods. Or, EPA may instead choose to provide guidance about the appropriate set of method options and a calibration range that will provide sufficient sensitivity to meet the effluent guideline limitations and standards.

Sixth, EPA intends to compare the limitations and standards to averages and daily values from discharge monitoring reports (DMRs). In the preamble to the proposal, EPA referred to this as a ''real-world'' check, although it is important to remember that many facilities for which DMR data are available may not have the technology installed on which the limits were based. For this reason, EPA intends to classify the facilities into three groups using the information in the detailed surveys and responses to the request for individual weekly/daily DMR data. The groups would contain the DMR data from facilities with: (1) The model or comparable technologies; (2) more sophisticated technologies; and (3) treatment that would require upgrades as a consequence of the rule. For the first group, EPA would expect the DMR data to have values generally less than the limitations and standards. For the second group, EPA would expect generally lower values than group 1. For the third group, EPA still intends to evaluate the data, although it expects that the data will generally have higher concentration values than the

limitations and standards. (EPA has included costs for these facility upgrades as part of the rule.) For any unexpected results, EPA may perform a more detailed engineering review of the processes and treatment technologies underlying the DMR data. Depending on the results of that review, EPA might evaluate whether any additional modifications to the model technology and/or limitations and standards were necessary.

F. Errors in Current 40 CFR Part 432 and the February 2002 Proposed Rule Text

In researching the derivation of existing limitations and standards, EPA has preliminarily identified what appear to be errors in the current 40 CFR part 432 and/or the February 25, 2002, proposed rule text. EPA intends to evaluate these discrepancies in further detail and correct the CFR as part of the MPP final rule. This section describes the discrepancies that EPA has identified.

40 CFR part 432 currently specifies monthly average limitations and standards for fecal coliforms and pH, while the text of the final rules published in the **Federal Register** (39 FR 7900; February 28, 1974 and 40 FR 906; January 3, 1975) includes only daily maximum limitations and standards for those parameters. For the subparts regulating the discharge of fecal coliforms, the daily maximum limitation/standard is ''Maximum at any time 400 mpn/100 ml.'' For the subparts regulating pH, the daily maximum limitation/standard is ''within the range of 6.0 to 9.0.'' For Subparts A through J, the current 40 CFR part 432 specifies monthly average limitations/standards as well as daily maximum limitations/standards for fecal coliforms and pH. The monthly values are the same as the daily maximum values. This appears to be incorrect. Because the values are the same for the daily maximum limitations/standards and the monthly average limitations/standards, EPA does not expect that any facility will need to change its operations if EPA eliminates the monthly average limitations/standards currently codified in the CFR for fecal coliforms and pH. Before promulgating the final rule, EPA intends to further investigate the derivation of the existing limitations/standards.

EPA also notes that the tables (in the existing CFR) of NSPS in sections 432.65 and 432.75, provide different values for the standards depending on whether the units are kg/kkg or lb/1000 lbs. For example, the TSS daily maximum standard is 0.044 kg/kkg or 0.036 lb/1000 lbs in section 432.65, when the two numerical values should be the same, regardless of the units. A review of the final rule (40 CFR parts 906–907; January 3, 1975) and the 1974 development document for the processor segment of the meat processor point source category indicates that NSPS was set equal to the BPT limitations for all pollutant parameters. Based upon this assessment, EPA preliminarily concludes that the NSPS in the kg/kkg units are correct because they have the same values as the BPT limitations. In sections 432.65 and 432.75 of the February 25, 2002, proposed rule, EPA selected the values associated with the units of lb/1000 lbs. Thus, after further investigation, if these values associated with units of lbs/1000 lbs are indeed incorrect, EPA will use the standards in units of kg/kkg in its final rule.

Two errors exist in the current 40 CFR 432.62 for the BPT limitations for Subpart F. The first error is in the monthly average limitation in units of kg/kkg for oil and grease which has a value of ''0.000'' which should be ''0.006.'' The second error is in the daily maximum limitation for TSS which has a value of ''10.044 lb/1000 lbs'' which should be ''0.044 lb/1000 lbs.'' EPA corrected these errors in the February 25, 2002, proposed rule.

EPA has identified three errors in the limitations and standards in the proposed rule. First, we inadvertently omitted the existing pH limitations and standards. As explained in the preamble to the proposal (67 FR 8629), EPA had intended to retain these pH limitations and standards. Second, we inadvertently assigned incorrect units of measurement in footnote (1) to the values listed in 432.63(b) and 432.73(b). The units listed in these parts were ''mg/l (ppm)'' and should have been ''pounds per 1000 pounds (or g/kg) of finished product.'' Finally, in sections 432.82(b) and 432.92(b), the proposed rule refers to 432.62(b) for COD limitations in error. The referral should be to section 432.72(b).

IX. Consideration of Options

EPA is presenting revised cost, pollutant reduction, and economic impact estimates in Section X of today's notice. These estimates are based on the following: additional data from surveys received after the initial cut-off date, data received with comments or through requests from EPA Regions and States, data revisions to reflect follow-up with survey recipients, and changes that result from certain methodological revisions. EPA will base its determinations for the final rule on these revised results and any further revisions that result from comment on today's notice. In the sections below, EPA discusses options it is considering for the different regulatory levels of control (*e.g.*, BPT, BAT, NSPS) for the subcategories of the MPP industry (See summary in Table IX–1).

A. Description of Modified Options

Commenters requested that EPA consider modifications to the preferred options selected as the basis for the proposed limitations and standards for certain subcategories. As a result of additional data and comments, EPA is reconsidering the technology options for BPT, BAT, and NSPS limitations (or standards) that EPA evaluated for the proposed rule. EPA is now considering two options for the final limitations that represent modifications of those considered in the proposal. In addition, EPA is considering not adopting further regulation for certain subcategories. EPA notes that all technology-based options it considered for the proposal and is evaluating for the final rule (for all subcategories) would include primary and secondary biological treatment and disinfection.

The first modified option EPA is considering is based on treatment systems employing partial denitrification of the MPP wastewater. This option does not achieve the same degree of denitrification as the proposed Option 3 (*i.e.*, complete denitrification). EPA defined ''complete'' denitrification based on achieving a low effluent Nitrate + Nitrite concentration. EPA has designated this modified option as Option 2.5. Discussions with industry representatives and evaluation of sampling and DMR data led to consideration of Option 2.5. Industry representatives commented that they often are able to achieve some degree of denitrification, but could not achieve the levels considered in the proposal without a significant increase in costs. EPA identified several facilities which are achieving partial denitrification by evaluating the long-term average Nitrate + Nitrite (or Total Nitrogen) effluent concentration and each facility's treatment in place. EPA is considering Option 2.5 as a basis for BPT, BAT and NSPS for the final rule based on data from these facilities.

The second modified option under review builds on the partial denitrification technology in Option 2.5 by adding chemical phosphorus removal to the treatment train. EPA has designated this option as Option 2.5 + P. Option 2.5 + P adds a treatment unit consisting of a chemical addition using alum which aids in precipitating and settling phosphorus. EPA notes that it evaluated phosphorus removal as an

additional treatment step at proposal under Option 4. EPA is still considering Option 4 as a basis for the final limitations and standards for certain subcategories. Option 4 includes nitrification, complete denitrification and chemical phosphorus removal. There are several facilities currently employing Option 4 (or more advanced technology) in the MPP industry. EPA is now giving less consideration to Option 3, because the only MPP facility (a poultry slaughtering facility) to identify Option 3 technology on their survey was not able to provide EPA with supporting data (*i.e.*, nitrate/nitrite, TKN, or total nitrogen effluent concentrations). Therefore, EPA did not have a facility to use as the basis for establishing long-term average concentrations for Option 3. The only facilities determined to have complete denitrification also used chemicals to remove phosphorus. EPA classified these facilities as Option 4. EPA notes that for the purposes of comparison it also looked at an option consisting of the nitrification treatment system of Option 2 followed by phosphorus removal (referred to as Option 2 + P). However, EPA is not considering Option 2 + P further for the final rule because of the considerable increase in cost as compared to either Option 2 or Option 2.5 (*i.e.*, an additional $31 million and $23 million, respectively) without the additional nitrogen removals associated with Option 2.5.

The options EPA is considering for non-small facilities in Subcategories A–D and K for the final rule are listed in Table IX–1, below. As discussed previously, EPA is not providing the revised estimates of costs, pollutant reductions, or economic impacts for small slaughtering facilities or meat and poultry further processing (Subcategories F–I and L) and independent rendering (Subcategory J) facilities in today's notice due to time constraints. However, those estimates are provided in, Section 21.1, DCNs 125803, 125606, 126002, and 126003 of the public record. EPA notes that it is considering the modified options discussed above, in addition to the proposed options, for those subcategories as well.

TABLE IX–1.—OPTIONS BEING CONSIDERED FOR NON-SMALL FACILITIES IN SUBCATEGORIES A–D AND K

Option	Description
2	Biological Treatment + Nitrification
2.5	Biological Treatment + Nitrification + Partial Denitrification
2.5 + P	Biological Treatment + Nitrification + Partial Denitrification + Chemical Phosphorus Removal
4	Biological Treatment + Nitrification + Complete Denitrification + Chemical Phosphorus Removal

B. Options Being Considered for Best Practicable Control Technology Currently Available (BPT)

As discussed in the proposal (67 FR 8582), in specifying BPT, EPA looks at a number of factors. EPA first considers the total cost of applying the control technology in relation to the effluent reduction benefits. The Agency also considers the age of the equipment and facilities, the processes employed and any required process changes, engineering aspects of the control technologies, non-water quality environmental impacts (including energy requirements), and such other factors as the EPA Administrator deems appropriate (CWA 304(b)(1)(B)). Traditionally, EPA establishes BPT effluent limitations based on the average of the best performances of facilities within the industry of various ages, sizes, processes or other common characteristics employing the BPT technology. Where existing performance is uniformly inadequate, BPT may reflect higher levels of control than currently in place in an industrial category if the Agency determines that the technology can be practically applied.

1. Subcategories A–D (Meat Slaughterhouses)

EPA established BPT for the Meat subcategories (A–I) in 1974 based on biological treatment (*e.g.* aerobic and anaerobic treatment) to control five conventional pollutants or pollutant parameters (BOD_5, TSS, Oil & Grease, fecal coliforms, and pH). The BPT technology also provided some nitrification in the course of extended aeration. EPA did not, however, develop limits for ammonia based on this technology. In 2001, EPA proposed new BPT limitations based on Option 2 for non-small facilities in Subcategories A–D (meat slaughterhouses). Option 2 consists of biological treatment followed by complete nitrification to reduce ammonia. Based on comments and the completion of the review and incorporation of data from the detailed surveys, EPA is now also considering establishing limits based on Option 2.5 for BPT for the final rule. EPA estimates that 38 of 39 direct discharging facilities in these subcategories are currently employing Option 2 technology, while 13 of 39 facilities employ Option 2.5.

EPA notes that although more than 97 percent of facilities have the components of Option 2 technology in place, many facilities are not currently achieving the projected Option 2 target effluent concentrations presented in this notice. EPA has calculated the actual baseline discharges using each direct discharge survey recipient's 1999 effluent concentration data (DMR data) and survey information on treatment technology in place (*see* Sections III.B and IV.B for additional discussion of the revised cost and loading methodologies). When estimating the costs of compliance with Option 2, EPA has included costs for treatment optimization for a number of facilities to achieve the Option 2 average target effluent concentration. For example, EPA has included costs, for example, for increased aeration, increased chemical addition, increased sludge handling, additional process controls, in-process sampling and analytical testing, and additional capacity.

EPA also notes that even though one-third of the meat slaughtering (*i.e.*, first processing) facilities are performing partial denitrification (Option 2.5), they are not achieving the target effluent concentrations that EPA currently projects for this option. EPA believes these facilities may not be optimizing their performance, as suggested by reviewing their BOD:TKN ratios (see DCN 100765). Thus, for developing the estimates of compliance costs and pollutant loadings presented in today's notice, EPA transferred the target effluent concentration for Total N from well-operated facilities at Option 2.5 that slaughter poultry (Subcategory K) to red meat facilities in Subcategory A–D. EPA is aware that some commenters believe that red meat facilities may not be able to achieve the same limits as poultry facilities due to higher influent concentrations of nitrogen. EPA is continuing to explore this issue. After reviewing the detailed surveys, EPA believes that in many cases facilities may need additional capacity (through installation of anoxic tanks) and additional pumping (for nitrate recycle) to perform partial denitrification. EPA notes that some facilities may also require additional equipment (*e.g.*,

carbon source, lagoon bypass). See Section III.B for a discussion on the revised cost methodology and Section V.D for a discussion on transferring nitrogen data from poultry to red meat facilities. EPA notes that references, such as Randall, C., Barnard, J., Stensel, H., 1992. Design and retrofit of wastewater treatment plants for biological nutrient removal. Technomic Publishing Co., Inc., Lancaster, Pennsylvania, can provide guidance on how to upgrade treatment systems to perform nutrient removal (see DCN 100771 for other references).

EPA estimates that revising BPT to incorporate limits for Total Nitrogen under Option 2.5 will remove an additional 27.7 million pounds/year of nitrogen from the discharges of facilities in Subcategories A–D. In addition, as compared to the baseline (*i.e.*, pollutant loadings in 1999), Option 2.5 would also remove approximately 755,000 pounds/year of BOD_5, 1.06 million pounds/year of TSS, and 2.7 million pounds/year of ammonia (as nitrogen). However, because Option 2.5 includes the same technology as Option 2 with the addition of denitrification for Total Nitrogen removal, the reductions of BOD_5, TSS, and ammonia (as nitrogen) are the same for Option 2.5 and Option 2 (as revised in today's notice).

In balancing costs against the benefits of effluent reduction, EPA considers the volume and nature of expected discharges after application of BPT, the general environmental effects of pollutants, and the cost and economic impacts of the required level of pollution control. For the BPT cost-reasonableness (*i.e.*, BPT cost and removal comparison) calculation for this industry EPA chose to measure effluent reductions in terms of the sum of removals (in pounds) of BOD_5, Total Nitrogen, and Total Phosphorus so that it could capture the incremental changes between technology options (*e.g.*, Option 2 reduces BOD_5 but does not reduce Total Nitrogen (N), while Option 2.5 additionally reduces Total Nitrogen and Option 2.5+P additionally reduces Total Phosphorus (P)). EPA has made an effort to avoid ''double-counting'' pollutant reductions that would occur if, for example, EPA summed removals of COD and BOD. In past effluent limitations guidelines and standards, BPT cost and removal comparison has been as high as $37/lb-removed in 1999 dollars. As presented in Section X, EPA estimates the BPT cost and removal comparison for Option 2.5 (incremental to the baseline) to be $0.43/pound BOD_5, Total N, and Total P removed (1999$). The incremental BPT cost and removal comparison for moving from Option 2 to Option 2.5 is $0.27 per additional pound Total N removed (1999$) ($BOD_5$ and Total P would be unchanged from Option 2). Note that the only difference between these two options is the level of nitrogen removals. EPA solicits comment on the potential selection of both Option 2 and Option 2.5 for BPT for the final rule.

EPA is also considering a no further regulation option that would continue to rely on existing limitations and standards, along with any more stringent limitations required to attain and maintain water quality standards, including those derived from a wasteload allocation in a TMDL (total maximum daily load). EPA solicits comment on a no further regulation option for facilities in Subcategory A–D.

2. Subcategory K (Poultry Slaughterhouses)

This section describes the options EPA is considering for developing BPT limitations for non-small facilities in the proposed Subcategory K. As discussed in Section X.A, EPA is not presenting revised costs, pollutant reductions, and economic impacts in today's notice for small Subcategory K facilities; however, those results are presented in Section 21.1, DCNs 125803 and 126003 in the public record.

Unlike the meat subcategories discussed in Section IX.B.1, there are no existing effluent guidelines for facilities in the poultry slaughtering subcategory (Subcategory K). EPA proposed to establish the BPT level of control based on Option 3 for non-small facilities and Option 1 for small facilities in this subcategory. Option 1 consists of primary and secondary biological treatment with partial nitrification and disinfection while Option 3 includes primary and secondary biological treatment with complete nitrification, complete denitrification, and disinfection. As discussed previously in IX.A, EPA is now giving less consideration to Option 3. Based on additional review and evaluation of the data and comments, EPA is considering whether to base BPT limitations on Option 2, Option 2.5 or 2.5 + P for non-small facilities in this subcategory for the final rule. EPA is also considering a no-regulation option, in which facilities in Subcategory K would continue to be regulated based on facility-specific BPJ limitations established by the permitting authority, along with any more stringent water-quality based limitations that might be required to attain and maintain water-quality standards, including limitations based on a wasteload allocation in a TMDL.

EPA estimates that 111 of 118 non-small direct discharging facilities in this subcategory currently employ Option 2 technology or more advanced technology, while 45 employ Option 2.5 or more advanced technology, and 17 facilities employ Option 2.5 + P or more advanced technology. As noted above, many of the facilities employing these technology options do not currently achieve the target effluent concentrations that EPA is projecting and so would likely have to undertake additional upgrades, optimization, and process control measures.

EPA estimates that establishing Option 2.5 for BPT would reduce discharges of BOD_5, TSS, COD, Ammonia, and Total N by approximately pounds/year, 1.4 million pounds/year, 6.3 million pounds/year, 470,000 pounds/year, and 3.5 million pounds/year, respectively. Option 2 would remove the same amounts of all pollutants except Total N, which Option 2 is not designed to remove (*i.e.*, Option 2 removes 0 pounds/year of Total N). As discussed above, for the BPT cost and removal comparison calculation for this industry EPA chose to measure effluent reductions in terms of the sum of removals (in pounds) of BOD_5, Total Nitrogen, and Total Phosphorus in assessing effluent reduction benefits. As presented in Section X, EPA estimates the BPT cost and removal comparison for Option 2 (incremental to the baseline) to be $12.89/pound BOD_5, Total N, and Total P removed (1999$). The average BPT cost and removal comparison for Option 2.5 would be $3.93/pound BOD_5, Total N, and Total P removed (1999$). While the incremental BPT cost and removal comparison of Option 2.5 versus Option 2 would be $2.28 per additional pound of Total N (1999$; BOD_5 and Total P would be unchanged from Option 2).

EPA estimates that establishing Option 2.5 + P for BPT would result in the same reductions of BOD_5, TSS, COD, Ammonia, and Total N as Option 2.5 but would also reduce Total Phosphorus by 3.8 million pounds/year. As presented in Section X, EPA estimates the BPT cost and removal comparison for Option 2.5 + P (incremental to the baseline) to be $5.70/pound BOD_5, Total N, and Total P removed (1999$). The incremental cost and removal comparison from Option 2.5 to Option 2.5+P is $7.61/pound Total P removed (1999$) (Total N and BOD_5 would be the same as under Option 2.5). EPA solicits comment on the potential selection of Option 2, Option 2.5, and Option 2.5 + P for BPT for this subcategory for the final rule, and on a no-regulation option

that continues to rely on site-specific BPJ permit limitations.

C. Options Being Considered for Best Available Technology Economically Achievable (BAT)

BAT effluent limitations guidelines represent the best economically achievable performance of facilities in the industrial subcategory or category. The CWA establishes BAT principally as a means of controlling the direct discharge of toxic and nonconventional pollutants. Generally, EPA determines economic achievability on the basis of total costs to the industry to implement the BAT options and the effect of these costs on overall industry and subcategory financial conditions. As with BPT, where existing performance is uniformly inadequate, BAT may reflect a higher level of performance than is currently being achieved based on technology transferred from a different subcategory or category. BAT may be based upon process changes or internal controls, even when these technologies are not common industry practice.

As discussed in the proposal (67 FR 8619), in recently promulgated effluent guidelines, EPA has relied primarily on the toxic pollutant cost-effectiveness measure for evaluating BAT, however, that measure is less appropriate for evaluating different options to control pollutants from the meat and poultry products industry because this industry's discharges consist of relatively more conventional pollutants and nutrients than toxic pollutants. Therefore, in addition to looking at economic impacts, EPA focused primarily on cost-reasonableness (for total pounds) for BPT, as described above, and nutrient cost-effectiveness in evaluating options for BAT.

EPA calculated the cost-effectiveness of the removal of nutrients for the options considered in the proposal and has done so for the modified options that EPA is considering for the final rule. As a basis of comparison, EPA estimated that the average cost-effectiveness of nutrient removal by POTWs with biological nutrient removal to be $4/lb for nitrogen and $10/lb for phosphorus (67 FR 8622). This is a rough average based on a range of removal costs at POTWs, and is not intended to be a bright line CE cutoff. Rather, it provides a general sense of how the BAT options under consideration for the MPP rule perform relative to POTWs in removing nutrients. The sections below described the options being considered for BAT for the final rule.

1. Subcategories A–D (Meat Slaughterhouses)

EPA proposed to establish the BAT level of regulatory control based on Option 3 (complete nitrification). As discussed in Section IX.A, EPA is now giving less consideration to Option 3. After review and evaluation of the revised and new data, EPA is considering establishing BAT for the non-small meat slaughterhouses based on Option 2.5, Option 2.5 + P or Option 4. EPA is also considering not establishing BAT limitations for these subcategories.

EPA evaluated Option 4 as a basis for establishing BAT more stringent than the BPT level of control. EPA estimates that there are no direct discharge facilities in these subcategories currently operating Option 4 technology. However, there is one indirect discharger in these subcategories and 5 poultry slaughtering facilities (Subcategory K) operating Option 4 technology (or more advanced technology). EPA is considering using data from the indirect discharge facility or transferring data (as is allowed by the CWA) from Subcategory K Option 4 facilities as the basis for BAT for Subcategories A–D. EPA notes that commenters raised concerns over the representativeness of the one indirect discharger facility. EPA has performed a comparison of the influent wastewater characteristics of this facility to the direct discharge facilities in these subcategories. This comparison suggests that the wastewater at this facility may be sufficiently similar to the wastewater at the direct discharge red meat facilities in Subcategories A–D to justify transferring data for development of limitations (see DCN 100766). EPA has addressed differences in treatment performance between the indirect discharger and the direct discharge sites in the cost model through its costing methodology. For example, EPA included costs for a lagoon bypass and additional anoxic tanks, mixers, pumps for facilities with a BOD:TKN ratio below 3 (see Section III.B for additional details on the revised cost methodology).

EPA estimates the pre-tax annualized compliance costs for Option 4 to be $47.6 million (1999$) (which is $5.6 million more than Option 2.5 + P and $35.2 million more than Option 2.5). EPA estimates no closures as a result of BAT based on Option 4, using the closure methodology discussed in Section VI. As a sensitivity analysis, EPA also estimated closures using a less stringent decision rule (closure under 1 out of 5 methodologies rather than at least 3 out of 5). Using this decision rule, EPA estimates one facility closure under Option 4. EPA notes that these estimates only include the 18 estimated total facilities in these subcategories for which EPA has sufficient data to conduct the closure analysis. There may be additional closures in the remaining 21 facilities.

EPA estimates that Option 4 removes 31.3 million pounds/year of nitrogen (3.7 million more pounds/year than Option 2.5 or Option 2.5 + P) and 5.66 million pounds/year of phosphorus (530,000 more pounds/year than Option 2.5 + P). As discussed above, in Subcategories A–D, there is one indirect discharge facility that currently operates Option 4.

EPA is also considering nutrient removal cost-effectiveness when evaluating potential BAT options for this industry. EPA estimates the nutrient cost-effectiveness (based of pounds of nitrogen removed) for Option 4 to be $9.68/pound nitrogen removed (incremental to BPT Option 2.5). EPA estimates the nutrient cost-effectiveness (based on pounds of phosphorus removed) for Option 4 to be $10.59/pound phosphorus removed (incremental to BPT Option 2.5+P). EPA notes that incremental results are presented somewhat differently in this section than in Section X. This section specifically compares the potential BAT option with the potential BPT option(s). EPA solicits comment on the potential selection of Option 4 as the basis of BAT for these subcategories.

EPA is also considering establishing BAT for these subcategories based on Option 2.5 + P. EPA estimates the pre-tax annualized compliance costs for Option 2.5 + P to be approximately $42 million (1999$). EPA estimates that no facilities (out of the 18 facilities analyzed) will close as a result of BAT based on Option 2.5 + P in these subcategories. Under the closure sensitivity analysis discussed above, one of the analyzed facilities would close as a result of Option 2.5+P. EPA estimates that Option 2.5 + P removes the same 2.7 million pounds/year of ammonia (as nitrogen) and 27.7 million pounds/year of total nitrogen as Option 2.5 but removes an additional 5.1 million pounds/year of phosphorus. In Subcategories A–D, there are 13 of 39 direct discharge facilities that currently operate Option 2.5 technology (though not necessarily achieving the projected Option 2.5 target effluent concentrations) and there are 6 direct dischargers and one indirect discharger that employ phosphorus removal (under option 2 + P or Option 4). However, EPA notes there are no facilities that

employ Option 2.5 + P in these subcategories, although this combination is well demonstrated in the poultry industry (10 direct discharge facilities operate Option 2.5 + P).

As discussed above, EPA is also considering nutrient removal cost-effectiveness when evaluating potential BAT options for this industry. EPA estimates the nutrient cost-effectiveness (based on pounds of phosphorus removed) for Option 2.5 + P to be $5.78/pound phosphorus removed (incremental to BPT Option 2.5). EPA solicits comment on the potential selection of Option 2.5 + P as the basis of BAT for these subcategories.

EPA is also evaluating whether it should establish BAT equal to Option 2.5. Under this approach, the cost of the BAT limitations would be $12.4 million (1999$). Moreover, there are no facility closures (out of the 18 facilities analyzed) associated with the option under the primary closure analysis and one facility closure under the sensitivity analysis. BAT limitations based on Option 2.5, as explained above, would result in removal of 2.7 million pounds/year of ammonia as nitrogen and 27.7 million pounds/year of total nitrogen. The nutrient cost-effectiveness of Option 2.5 relative to BPT Option 2 would be $0.27/pound total nitrogen removed. EPA solicits comment on the potential selection of Option 2.5 as the basis for BAT for these subcategories.

In its evaluation of effluent limitations guidelines for this subcategory, one option EPA is reviewing is the option not to establish BAT limitations. Section 301(b)(2)(A) of the CWA authorizes EPA to establish BAT limitations for categories of sources that limit discharges of toxic and non-conventional pollutants. In establishing BAT limitations, EPA considers a number of factors specified in the statute (*e.g.*, age of equipment and facilities, engineering aspects of various types of controls, non-water quality environmental impacts), including other factors deemed appropriate by the Administrator. Section 304(b)(2)(B). The bulk of the pollutant discharges from this category are conventional and non-conventional pollutant discharges, with no significant discharges of toxic pollutants. The non-conventional pollutant discharges from this category consist largely of nutrients. In certain cases, nutrients may represent a significant water quality problem for specific water bodies. Where necessary to protect local water quality, individual dischargers may currently be subject to water quality-based effluent limitations for nutrient discharges. EPA is evaluating whether it is appropriate to establish national BAT limitations for this subcategory more stringent than BPT limitations or whether these nutrient discharges are more appropriately addressed on a case-by-case basis in individual permits based on applicable water quality standards. EPA will be examining data on water quality impacts from MPP facilities as part of its benefits analysis and specifically the extent to which such discharges significantly contribute to water quality impairments from nutrients. EPA requests comment on not establishing BAT limitations for these subcategories.

2. Subcategory K (Poultry Slaughterhouses)

This section describes the options EPA is considering for BAT for non-small facilities in the proposed Subcategory K. As discussed in Section IX.A, EPA is not presenting revised costs, pollutant reductions, and economic impacts in today's notice for small Subcategory K facilities; however, those results are presented in Section 21.1, DCNs 125803 and 126003 of the public record.

EPA proposed to establish the BAT level of regulatory control based on Option 3 (complete nitrification) for non-small facilities in this subcategory. As discussed in Section IX.A, EPA is now giving less consideration to Option 3. After review and evaluation of the revised and new data, EPA is considering establishing BAT for these facilities based on either Option 2.5, Option 2.5 + P, or Option 4. As with Subcategories A–D, discussed above, EPA is also considering not establishing BAT limitations for this subcategory.

EPA is considering establishing BAT for this subcategory based on Option 4. EPA estimates the pre-tax annualized compliance costs for Option 4 to be $83.4 million (1999$) (which is $37.9 million more than Option 2.5 + P and $67 million more than Option 2.5). EPA estimates that 7 facilities and 1 company will close as a result of BAT based on Option 4 under both the primary and sensitivity closure analysis. Note that these estimates only include the 34 estimated total facilities in this subcategory for which EPA has sufficient data to conduct the closure analysis. There may be additional closures in the remaining 84 facilities. The company level results are based on the analysis of 26 companies. While EPA does not have an estimate of the total number of companies operating facilities in this subcategory, EPA believes these 26 companies account for the majority of Subcategory K facilities (see Section X.A.2.c for further discussion). As discussed in Section X, based on EPA's market analysis, the maximum projected price increase occurs under Option 4 but is less than 0.1 percent of baseline price for chicken and turkey. In addition, the domestic production of meat products, and therefore industry employment, is projected to decrease by about 0.04 percent under Option 4.

EPA estimates that Option 4 removes an additional 10.9 million pounds/year of nitrogen compared to Option 2.5 or Option 2.5 + P and an additional 534,000 pounds/year of phosphorus compared to Option 2.5 + P. In Subcategory K, there are 5 of 118 direct discharge facilities that currently operate with Option 4 pollution control technology (or more advanced technology).

As discussed above, EPA is also considering nutrient removal cost-effectiveness when evaluating potential BAT options for this industry. EPA estimates the nutrient cost-effectiveness (based on pounds of nitrogen removed) for Option 4 to be $6.14/pound nitrogen removed (incremental to BPT Option 2.5). EPA estimates the nutrient cost-effectiveness (based on pounds of phosphorus removed) for Option 4 to be $70.96/pound phosphorus removed (incremental to BPT Option 2.5 + P). EPA solicits comment on the potential selection of Option 4 as the basis of BAT for this subcategory.

EPA is also considering establishing BAT for this subcategory based on Option 2.5 + P. EPA estimates the pre-tax annualized compliance costs for Option 2.5 + P to be approximately $45.5 million (1999$) (which is approximately $29 million more than Option 2.5). EPA estimates that no facilities (of the 34 facilities analyzed) and one company (if the 13 poultry companies analyzed) will close as a result of BAT based on Option 2.5 + P under either the primary or sensitivity closure analyses. EPA notes that the poultry company that is projected to close did not provide facility level financial information; therefore, the facilities owned by this company could not be analyzed. EPA estimates that Option 2.5 + P removes an additional 3.8 million pounds/year of phosphorus as compared to Option 2.5. In Subcategory K, there are 17 of 118 direct discharge facilities that currently operate Option 2.5 + P technology (or more advanced technology). EPA estimates the nutrient cost-effectiveness (based on pounds of phosphorus removed) for Option 2.5 + P to be $7.61/pound phosphorus removed (incremental to BPT Option 2.5). EPA solicits comment on the potential

selection of Option 2.5 + P as the basis of BAT for this subcategory.

EPA is also considering whether it should base BAT limitations on Option 2.5. As previously noted, EPA estimates the pre-tax annualized compliance costs for Option 2.5 to be approximately $16.3 million (1999$). EPA estimates that none of the analyzed facilities will close as a result of compliance with Option 2.5 limitations in this subcategory under either the primary or sensitivity closure analyses. This option would remove an additional 3.5 million pounds of Total N per year relative to Option 2 (as Option 2 is not designed to remove Total N), for an incremental nutrient cost effectiveness of $2.28/pound Total N removed (1999$). EPA solicits comment on the potential selection of Option 2.5 as the basis of BAT for this subcategory. EPA is also considering not establishing BAT limitations for this subcategory for the same reasons discussed above for Subcategories A–D, and solicits comment on this option.

D. Options Being Considered for New Source Performance Standards (NSPS)

When establishing the NSPS level of control, EPA considers the barrier that compliance costs due to the effluent guidelines regulation pose to entry into the industry for a new facility. The barrier to entry analysis compares estimated average incremental facility or company capital costs incurred to meet the effluent guidelines to average total assets of existing facilities or companies. To the extent that potential new entrants have similar total assets to existing industry participants, this provides a proxy for the potential barrier to entry that new facility compliance costs may represent. EPA does not have data on the assets of potential new entrants because in general they cannot be identified in advance. The analysis was performed to evaluate the effect of the MPP rule on the costs faced by new entrants into the meat and poultry products industry. Increased start-up costs resulting from the capital costs of the MPP regulation (as revised in this notice) may prevent entrepreneurs from entering the industry. The calculated ratio of average capital costs to average total assets measures the potential for barriers to entry due to the MPP rule. If the barrier to entry ratio is large, then the possibility exists that the rule will discourage entry into the meat and poultry products market. EPA solicits comment on other measures of ''barrier to entry'' that would be appropriate for this industry.

For both the red meat (Subcategories A–D) and Poultry (Subcategory K) slaughtering facilities, EPA is considering setting the NSPS limitations equivalent to BAT or the next level of stringency. For example, if Option 2.5 is the basis for BAT for the final rule, then EPA would consider Option 2.5 as well as Option 2.5 + P for new sources and if Option 2.5 + P is the basis for BAT, then EPA would consider Option 2.5 + P as well as Option 4 for new sources. EPA has estimated the ratio of capital costs to assets for each of the options (see Section X of today's notice). If EPA did not establish BAT limitations for existing facilities then EPA would establish NSPS equivalent to BPT or the next level of stringency. EPA solicits comment on NSPS for all MPP industry subcategories.

X. Revised Estimates of Costs, Loadings, Economic Impacts and Cost-Effectiveness

A. Revised National Estimates of Costs, Loadings, and Economic Impacts

EPA is providing the results of its preliminary economic analysis based on revised costs and selected changes in methodologies discussed above in Sections III and IV. All other aspects of the economic analysis methodology remain as described at proposal. Analyses presented in this section incorporate costs and loadings that reflect the sample weights discussed in Section III.B.3. of this document.

Results presented here remain in 1999 dollars, for purpose of comparison with the results of the proposed rule analysis. The analysis EPA will prepare for the final rule will be presented in 2002 dollars.

1. Results Using the Economic Impact Analysis Methodologies

Many of the surveyed facilities did not provide enough financial data for EPA to perform an adequate economic impact analysis. Thus, the total number of facilities in each class or subcategory is not equivalent to the number of facilities analyzed. In Subcategories A through D, 21 of 39 facilities in the national estimate could not be analyzed due to lack of data. In Subcategory K, 84 of 118 facilities in the national estimate were not analyzed due to lack of data. Thus, the facility closure analysis represents projected closures at only 46 percent (18/39) of facilities in Subcategories A–D and 29 percent (34/118) of facilities in Subcategory K nationally. There may be additional closures at the remaining 54 percent and 71 percent of Subcategory A–D facilities and Subcategory K facilities, respectively, that could not be analyzed.

For cost annualization and the closure analysis, a 6.6 percent discount rate was used if facilities did not provide a usable discount rate in their survey data. The 6.6 percent discount rate is a weighted average of the discount rate data provided in the surveys. If the facility provided a nominal discount rate greater than 3 percent but less than 19 percent in their survey then that value was used to run the impact analysis. Discount rates outside that range were deemed to reflect internal hurdle rates rather than the opportunity cost of capital.

2. Summary of Results

a. National Costs

Total pretax annualized costs of the rule range from $13 million under Option 2 to $131 million under Option 4. Pretax annualized costs per facility are consistently larger in Subcategories A though D ($127,000 to $1.2 million) than in Subcategory K ($71,000 to $707,000). See Table X.A–1 for compliance costs by subcategory and treatment option.

TABLE X.A—1.—TOTAL AND AVERAGE COMPLIANCE COSTS BY SUBCATEGORY AND OPTION

Option	Total costs ($000)			Average costs ($000)		
	Capital	Post-tax annualized	Pre-tax annualized	Capital	Post-tax annualized	Pre-tax annualized
Subcategories A through D (39 facilities)						
Option 2	$6,646	$3,037	$4,951	$170.4	$77.9	$127.0
Option 2.5	67,885	8,986	12,359	1,740.6	230.4	316.9
Option 2 + P	36,385	23,089	35,574	933.0	592.0	912.1
Option 2.5 + P	86,118	27,875	42,004	2,208.1	714.7	1,077.0

TABLE X.A—1.—TOTAL AND AVERAGE COMPLIANCE COSTS BY SUBCATEGORY AND OPTION—Continued

Option	Total costs ($000)			Average costs ($000)		
	Capital	Post-tax annualized	Pre-tax annualized	Capital	Post-tax annualized	Pre-tax annualized
Option 4	104,090	31,418	47,627	2,669.0	805.6	1,221.2
Subcategory K (118 facilities)						
Option 2	18,856	6,656	8,333	159.8	56.4	70.6
Option 2.5	74,219	13,321	16,329	629.0	112.9	138.4
Option 2 + P	65,644	29,683	38,999	556.3	251.6	330.5
Option 2.5 + P	99,509	34,743	45,492	843.3	294.4	385.5
Option 4	299,178	65,400	83,368	2,535.4	554.2	706.5

b. National Loadings

Table X.A–2 shows estimated pollutant reductions for each treatment option. The conventional pollutant loadings (*i.e.* 5-Day Biological Oxygen Demand, Total Suspended Solids and Oil and Grease) removed for Options 2, 2+P, 2.5 and 2.5+P are identical for Subcategories A through D and Subcategory K, respectively. Options 2+P, 2.5 and 2.5+P represent additional removals of nutrients, not conventional pollutants, over Option 2. Option 4 provides additional removals of both nutrients and conventional pollutants relative to other options.

TABLE X.A–2.—REMOVAL OF SPECIFIED POLLUTANTS BY SUBCATEGORY AND OPTION [1]

Subcategory	Pollutant	Removals (pounds per year)				
		Option 2	Option 2.5	Option 2+P	Option 2.5+P	Option 4
A through D	5-Day Biochemical Oxygen Demand.	755,213	755,213	755,213	755,213	795,121
	Total Suspended Solids	1,058,991	1,058,991	1,058,991	1,058,991	1,236,504
	Chemical Oxygen Demand	0	0	0	0	0
	Carbonaceous Biochemical Oxygen Demand.	633,168	633,168	633,168	633,168	633,168
	Ammonia as Nitrogen	2,717,147	2,717,147	2,717,147	2,717,147	2,789,738
	Total Nitrogen	0	27,688,678	0	27,688,678	31,331,318
	Total Phosphorus	0	0	5,128,793	5,128,793	5,659,799
	Nitrate/Nitrite	0	26,910,414	0	26,910,414	28,762,544
	Total Kjeldahl Nitrogen	2,669,042	2,669,042	2,669,042	2,669,042	2,690,827
	Oil & Grease (HEM)	0	0	0	0	0
K	5-Day Biochemical Oxygen Demand.	646,527	646,527	646,527	646,527	846,484
	Total Suspended Solids	1,420,573	1,420,573	1,420,573	1,420,573	2,728,104
	Chemical Oxygen Demand	6,278,429	6,278,429	6,278,429	6,278,429	10,788,159
	Carbonaceous Biochemical Oxygen Demand.	707,270	707,270	707,270	707,270	707,270
	Ammonia as Nitrogen	469,249	469,249	469,249	469,249	664,527
	Total Nitrogen	0	3,509,950	0	3,509,950	14,427,113
	Total Phosphorus	0	0	3,830,011	3,830,011	4,363,815
	Nitrate/Nitrite [2]	0	6,156,008	0	6,156,008	13,325,056
	Total Kjeldahl Nitrogen	307,004	307,004	307,004	307,004	975,539
	Oil & Grease (HEM)	320,986	320,986	320,986	320,986	346,840

[1] Incremental to baseline of current performance. Current performance based on summarized 1999 DMR data provided in response to detailed surveys. Pollutant loading for various treatment options based on sampling data, survey information, and DMR data. (*See* Section IV for discussion of loadings methodology).

[2] EPA recognizes that, in theory, total nitrogen should be less than nitrate/nitrite as nitrogen because total nitrogen is the sum of nitrate/nitrite as nitrogen and total kjeldahl nitrogen. However, the target effluent concentrations were taken from different sets of facilities (*i.e.* those that provided total nitrogen data and those that provided nitrate/nitrite as nitrogen data). EPA anticipates regulating total nitrogen, not nitrate/nitrite nitrogen for the final rule.

c. Closure Analysis

A facility (or company) forecast to have a negative net present value (NPV) of net income under at least 3 of 5 methods (described in Section VI.A) prior to regulatory costs are called ''baseline closures.'' In Subcategories A through D there are two baseline closures; in Subcategory K there are 10 baseline closures. The economic impact of the rule on ''baseline closures'' cannot be assessed using the closure model. Under the sensitivity analysis, in which a negative NPV under only 1 method is sufficient to project a closure, EPA estimates that 7 facilities are baseline closures in Subcategories A–D and 15 facilities are baseline closures in Subcategory K.

In the facility level closure analysis, no facility closures are projected under any options for Subcategories A through D under the primary analysis for the 18 out of 39 facilities analyzed and 1 facility closure is projected for all options under the sensitivity analysis. For Subcategory K, under either the primary or sensitivity analysis seven facilities from the 34 facilities out of the

118 analyzed are projected to close under Option 4 and no facility closures are projected under other treatment options.

TABLE X.A–3.—SUMMARY OF PROJECTED FACILITY CLOSURE IMPACTS BY SUBCATEGORY AND OPTION (PRIMARY ANALYSIS)

Option	Number of facilities	Total revenues ($000)	Employees
Subcategories A through D			
Total Facilities Analyzed [1]	18	$9,303,506	48,114
Baseline Closures	2	1,000,000–2,500,000	5,000–7,500
Option 2 Closures	0	0	0
Option 2 + P Closures	0	0	0
Option 2.5 Closures	0	0	0
Option 2.5 + P Closures	0	0	0
Option 4 Closures	0	0	0
Subcategory K			
Total Facilities Analyzed [2]	34	$4,023,230	112,491
Baseline Closures	10	1,584,600	13,260
Option 2 Closures	0	0	0
Option 2 + P Closures	0	0	0
Option 2.5 Closures	0	0	0
Option 2.5 + P Closures	0	0	0
Option 4 Closures	7	250,000–500,000	2,500—5,000

[1] Of the 39 facilities estimated to be in Subcategories A through D, EPA was able to analyze data from surveys representing 18 facilities; the remaining surveys (representing 21 facilities) did not provide sufficient data to be analyzed, and therefore, the number of closures among these facilities is not reflected in the table and is unknown.

[2] Of the 118 facilities estimated to be in Subcategory K, EPA was able to analyze data from surveys representing 34 facilities; the remaining surveys (representing 84 facilities) did not provide sufficient data to be analyzed, and therefore, the number of closures among these facilities is not reflected in the table and is unknown.

In the primary company level closure analysis, one poultry company is projected to close under Option 2 + P, Option 2.5 + P, and Option 4. This company employs between 2,500 and 5,000 workers. The poultry company that is projected to close did not provide facility level financial information, therefore the facilities owned by this company could not be analyzed. Under the sensitivity analysis, the same poultry company (under the same options) is projected to close as well as one red meat company under all treatment options and one mixed meat (*i.e.,* company owns both poultry and red meat facilities) company under Options 2 + P, 2.5 + P, and Option 4.

TABLE X.A–4.—SUMMARY OF PROJECTED COMPANY CLOSURE IMPACTS BY SUBCATEGORY AND OPTION (PRIMARY ANALYSIS)

Option	Baseline conditions and projected incremental closure impacts [1]		
	Number of companies	Total revenues ($millions)	Employees
Red Meat (Predominantly Own Facilities in Subcategories A through I)			
Total Companies Analyzed	9	$29,949	80,755
Baseline Closures	1	250–500	1,000–4,000
Option 2 Closures	0	0	0
Option 2 + P Closures	0	0	0
Option 2.5 Closures	0	0	0
Option 2.5 + P Closures	0	0	0
Option 4 Closures	0	0	0
Poultry (Predominantly Own Facilities in Subcategories K and L)			
Total Companies Analyzed	13	$15,455	136,000
Baseline Closures	6	3,400	31,190
Option 2 Closures	0	0	0
Option 2 + P Closures	1	100–150	2,500–5,000
Option 2.5 Closures	0	0	0
Option 2.5 + P Closures	1	100–150	2,500–5,000
Option 4 Closures	1	100–150	2,500–5,000
Mixed (Own Facilities in Both Red Meat and Poultry Subcategories)			
Total Companies Analyzed	4	89,439	184,834

TABLE X.A–4.—SUMMARY OF PROJECTED COMPANY CLOSURE IMPACTS BY SUBCATEGORY AND OPTION (PRIMARY ANALYSIS)—Continued

Option	Baseline conditions and projected incremental closure impacts [1]		
	Number of companies	Total revenues ($millions)	Employees
Baseline Closures	0	N/A	N/A
Option 2 Closures	0	0	0
Option 2 + P Closures	0	0	0
Option 2.5 Closures	0	0	0
Option 2.5 + P Closures	0	0	0
Option 4 Closures	0	0	0

[1] Projected revenue and employment impacts are presented as a range to prevent the disclosure of confidential business information.

Company level results are unweighted because the survey sampling frame was stratified on the basis of facility level data. Therefore, the facility level and company level results are not additive. Because of the large number of facilities that were unable to submit financial data in their survey, EPA performed a subsidiary company level analysis to provide a consistency check on the primary facility level analysis. EPA has estimated that the 26 companies in the company level analysis own at least 117 of the 157 in-scope facilities that EPA project will be subject to regulation in Subcategories A-D and K.

d. Altman Z′ Analysis

EPA used the Altman Z′ ratio to assess the baseline financial condition of MPP firms and the incremental impacts of the rule on their financial health. Note this analysis includes the same 26 companies analyzed for company closure analysis. In the baseline, the Altman Z′ analysis shows that 7 red meat companies and 8 poultry companies are considered financially healthy. One red meat company, 5 poultry companies, and 3 mixed meat companies have Altman Z′ scores in the indeterminate range for financial health; 1 red meat company and 1 mixed meat company are considered financially stressed. Under Option 4, the Altman Z′ score for one poultry company changed from the financially healthy to the indeterminate range (represented by the +1 and −1 on Table X.A–5).

TABLE X.A–5.—PROJECTED IMPACTS ON COMPANY ALTMAN Z' SCORE BY MEAT TYPE AND OPTION

Option	Number of companies with baseline Altman Z' score in specified range and incremental changes in score		
	Financially healthy	Indeterminate	Bankruptcy likely
Red Meat (predominantly own facilities in Subcategories A through I)			
Baseline	7	1	1
Option 2	0	0	0
Option 2 + P	0	0	0
Option 2.5	0	0	0
Option 2.5 + P	0	0	0
Option 4	0	0	0
Poultry (predominantly own facilities in Subcategories K and L)			
Baseline	8	5	0
Option 2	0	0	0
Option 2 + P	0	0	0
Option 2.5	0	0	0
Option 2.5 + P	0	0	0
Option 4	−1	+1	0
Mixed (own facilities in both red meat and poultry subcategories)			
Baseline	0	3	1
Option 2	0	0	0
Option 2 + P	0	0	0
Option 2.5	0	0	0
Option 2.5 + P	0	0	0
Option 4	0	0	0

Note: A change from one state (*e.g.,* financially healthy) to another state (*e.g.,* indeterminate) is indicated by ''−1'' and ''+1''.

e. Sales Test

None of the analyzed facilities are projected to incur costs exceeding 3 percent of revenues (pre-tax). In addition, none of the analyzed facilities in Subcategories A through D are projected to incur costs exceeding 1 percent of revenues under any option. In Subcategory K, no analyzed facilities

are projected to incur costs exceeding 1 percent of revenues under Option 2, Option 2 + P, or Option 2.5, while 4 analyzed facilities are projected to incur costs exceeding 1 percent of revenues under Option 2.5 + P and 17 analyzed facilities under Option 4.

TABLE X.A–6.—FACILITIES WITH ANNUALIZED COSTS EXCEEDING 3 PERCENT OF REVENUES BY SUBCATEGORY AND OPTION

Option	Facilities with annualized costs exceeding 3 percent of revenues		Facilities with annualized costs exceeding 1 percent of revenues	
	Pre-tax	Post-tax	Pre-tax	Post-tax
Subcategories A through D (18 facilities analyzed) [1]				
Option 2	0	0	0	0
Option 2 + P	0	0	0	0
Option 2.5	0	0	0	0
Option 2.5 + P	0	0	0	0
Option 4	0	0	0	0
Subcategory K (34 facilities analyzed) [2]				
Option 2	0	0	0	0
Option 2 + P	0	0	0	0
Option 2.5	0	0	0	0
Option 2.5 + P	0	0	4	0
Option 4	0	0	17	7

[1] Of the 39 facilities estimated to be in Subcategories A through D, EPA was able to analyze data from surveys representing 18 facilities; the remaining surveys (representing 21 facilities) did not provide sufficient data to be analyzed, and therefore, the number of closures among these facilities is not reflected in the table and is unknown.

[2] Of the 118 facilities estimated to be in Subcategory K, EPA was able to analyze data from surveys representing 34 facilities; the remaining surveys (representing 84 facilities) did not provide sufficient data to be analyzed, and therefore, the number of closures among these facilities is not reflected in the table and is unknown.

f. Market Level Impacts

EPA analyzed the impact of the rule on market price, domestic supply, domestic consumption, and international trade of four meat types (beef, pork, chicken, and turkey). Pre-tax annualized compliance costs per pound of carcass weight for each of the four meat types measures the vertical shift in the supply curve in response to the effluent limitations guidelines. The most appropriate measure of the shift in supply is the cost per pound of total industry production because: (1) The majority of facilities incur no costs, and (2) the competition from facilities that do not incur costs will discourage affected facilities from increasing price by the full cost per pound of the ELG.

The results of the market analysis show that the decrease in supply will be smallest for pork, where the costs per pound of total production range from $0.000014 under Option 2 to $0.0005 under Option 4, and largest for turkey with costs per pound of total production ranging from $0.00036 under Option 2 to $0.0019 under Option 4. The maximum projected price increase is less than 0.1 percent of baseline price for chicken and turkey (under Option 4); price is projected to increase less than 0.04 percent of baseline for beef and pork under any option.

The domestic production of meat products, and therefore industry employment, is projected to decrease by about 0.04 percent under Option 4, and by lesser amounts under all other options for all meat types. In general, impacts to domestic consumption of meat products are somewhat smaller than impacts to domestic supply due to partially offsetting increases in meat imports.

Impacts on meat exports are of particular concern to the poultry sector. Exports are the means the poultry industry has used to sustain growth. Exports are also used to balance domestic preferences for white meat poultry products with the necessary production of dark meat as a byproduct of white meat production; dark poultry meat is preferred in other parts of the world. Meat exports are projected to decrease by less than 0.06 percent for poultry meat under all options except Option 4 which decreases by 0.11 percent.

TABLE X.A–7.—PROJECTED IMPACTS ON MEAT PRODUCT MARKETS

Option	Price ($/lb.)	Domestic supply (lbs. × 1 mil.)	Domestic demand (lbs. × 1 mil.)	Quantity imported (lbs. × 1 mil.)	Quantity exported (lbs. × 1 mil.)	Compliance costs per pound
Beef						
Baseline	$1.11050	26,386.0	26,843.0	2,874.0	2,417.0	.....
Option 2	1.11058	26,384.1	26,841.8	2,874.4	2,416.7	$0.00016
Option 2 + P	1.11085	26,378.7	26,838.7	2,875.8	2,415.8	0.00065
Option 2.5	1.11065	26,382.9	26,841.2	2,874.8	2,416.5	0.00028
Option 2.5 + P	1.11092	26,377.3	26,837.8	2,876.2	2,415.6	0.00078
Option 4	1.11098	26,376.2	26,837.3	2,876.5	2,415.4	0.00088

TABLE X.A–7.—PROJECTED IMPACTS ON MEAT PRODUCT MARKETS—Continued

Option	Price ($/lb.)	Domestic supply (lbs. × 1 mil.)	Domestic demand (lbs. × 1 mil.)	Quantity imported (lbs. × 1 mil.)	Quantity exported (lbs. × 1 mil.)	Compliance costs per pound
Pork						
Baseline	1.00380	19,278.00	18,827.0	827.00	1,278.00	.....
Option 2	1.00382	19,278.04	18,827.1	827.02	1,277.97	0.00001
Option 2 + P	1.00402	19,275.6	18,825.3	827.24	1,277.56	0.00042
Option 2.5	1.00390	19,277.0	18,826.3	827.11	1,277.81	0.00018
Option 2.5 + P	1.00407	19,275.1	18,825.0	827.29	1,277.47	0.00050
Option 4	1.00410	19,274.9	18,824.8	827.33	1,277.39	0.00056
Chicken						
Baseline	0.5807	29,741.0	24,826.0	5.0000	4,920.0	.....
Option 2	0.5808	29,739.8	24,825.3	5.0005	4,919.5	0.00016
Option 2 + P	0.5810	29,734.9	24,822.6	5.0026	4,917.3	0.00086
Option 2.5	0.5808	29,738.6	24,824.7	5.0010	4,919.0	0.00033
Option 2.5 + P	0.5810	29,733.9	24,822.1	5.0031	4,916.9	0.00100
Option 4	0.5812	29,727.8	24,818.3	5.0054	4,914.5	0.00184
Turkey						
Baseline	0.6898	5,297.0	4,919.2	1.2500	379.0	.....
Option 2	0.6899	5,296.6	4,918.9	1.2502	378.9	0.00036
Option 2 + P	0.6900	5,296.1	4,918.5	1.2505	378.8	0.00085
Option 2.5	0.6900	5,296.3	4,918.7	1.2503	378.9	0.00058
Option 2.5 + P	0.6901	5,295.8	4,918.3	1.2506	378.8	0.00106
Option 4	0.6903	5,294.8	4,917.4	1.2510	378.7	0.00191

B. Revised National Estimates of Cost Reasonableness and Cost-Effectiveness

EPA performed a revised cost reasonableness and nutrient cost-effectiveness analysis based on the revised estimates of costs, loadings and removals described previously. As noted in Section X, incremental results are presented somewhat differently here than in that section, reflecting changes associated with increasingly stringent options irrespective of which technology standard (BPT vs. BAT) they are being considered under.

1. Cost Reasonableness of Pollutant Removals: BPT Cost and Removal Comparison

Based on BOD, total phosphorus, and total nitrogen, average BPT cost and removal comparison of pollutant removals ranges from $0.43 per pound (Option 2.5) to $6.56 per pound (Option 2) in Subcategories A through D, and from $3.93 per pound (Option 2.5) to $12.89 per pound (Option 2) in Subcategory K.

TABLE X.B–1.—BPT COST & REMOVAL COMPARISON

Option	Pre-tax annualized costs (1999$)	Total pounds removed [1]	Average BPT cost & removal comparison (1999$/pound)	Incremental BPT cost & removal comparison (1999$/pound)
Subcategories A through D				
Baseline	0	0	NA	NA
Option 2	$4,951,238	755,213	$6.56	$6.56
Option 2.5	12,359,499	28,443,891	0.43	0.27
Option 2 + P	35,573,746	5,884,007	6.05	DOM
Option 2.5 + P	42,004,409	33,572,685	1.25	0.23
Option 4	47,626,564	37,786,238	1.26	1.33
Subcategory K				
Baseline	0	0	NA	NA
Option 2	8,333,047	646,527	12.89	12.89
Option 2.5	16,328,846	4,156,478	3.93	2.28
Option 2 + P	38,998,615	4,476,538	8.71	70.83
Option 2.5 + P	45,492,024	7,986,488	5.70	1.85
Option 4	83,368,375	19,637,412	4.25	3.25

[1] Total pounds of: BOD, Total Phosphorus, and Total Nitrogen.

DOM: Option is dominated because it has higher cost and lower removals. Note however that the composition of removals is different with Option 2 + P having higher Total P and lower Total N removals than Option 2.5 (see Section X.B.2).

2. Cost Effectiveness of Nitrogen and Phosphorus Removals

The tables in this section provide both the incremental and average nutrient cost-effectiveness values. As a basis of comparison, EPA estimated that the average cost-effectiveness of nutrient removal by POTWs with biological nutrient removal to be $4/lb for nitrogen and $10/lb for phosphorus (67 FR 8622). EPA notes that Table X.B–2 displays the results for the nitrogen cost-effectiveness and, therefore, includes only options specifically designed to remove total nitrogen (*i.e.*, Option 2.5 and Option 4). Similarly, Table X.B–3 displays the results for the phosphorus cost-effectiveness and, therefore, only includes those options with a chemical phosphorus treatment step (*i.e.*, Option 2 + P and Option 4). Option 2.5 + P is also omitted from Table X.B–2 and Table X.B–3 because it provides no additional Total N removals relative to Option 2.5 and no additional Total P removals relative to Option 2 + P, respectively. Average cost-effectiveness (cost per pound of nitrogen removed) ranges from $0.45 (Option 2.5) to $1.52 (Option 4) in Subcategories A through D, and from $4.65 (Option 2.5) to $5.78 per pound (Option 4) in Subcategory K. The incremental cost-effectiveness from Option 2.5 to Option 4 is $9.68/pound of nitrogen removed for Subcategories A–D and $6.14/pound nitrogen removed for Subcategory K. Average cost-effectiveness (cost per pound of phosphorus removed) ranges from $6.94 (Option 2+P) to $8.41 (Option 4) in Subcategories A through D, and from $10.18 (Option 2+P) to $19.10 per pound (Option 4) in Subcategory K. The incremental cost-effectiveness from Option 2 + P to Option 4 is $22.70/pound of phosphorus removed for Subcategories A–D and $83/pound phosphorus removed for Subcategory K. EPA notes that the nutrient cost-effectiveness numbers presented below represent upper bounds because they assign all the costs for an option to either Total N or Total P removal even though the options also remove other pollutants. EPA used this approach to provide a conservative estimate of cost-effectiveness and because it does not have a good basis to divide up removal costs among pollutants.

TABLE X.B–2.—NUTRIENT COST-EFFECTIVENESS: TOTAL NITROGEN

Option	Pre-tax annualized costs (1999$)	Pounds removed	Average cost effectiveness (1999$/pound)	Incremental cost effectiveness (1999$/pound)
Subcategories A through D				
Baseline	$0	0	NA	NA
Option 2.5	12,359,499	27,688,678	$0.45	$0.45
Option 4	47,626,564	31,331,318	1.52	9.68
Subcategory K				
Baseline	0	0	NA	NA
Option 2.5	16,328,846	3,509,950	4.65	4.65
Option 4	83,368,375	14,427,113	5.78	6.14

TABLE X.B–3.—NUTRIENT COST-EFFECTIVENESS: TOTAL PHOSPHORUS

Option	Pre-tax annualized costs (1999$)	Pounds removed	Average cost effectiveness (1999$/pound)	Incremental cost effectiveness (1999$/pound)
Subcategories A through D				
Baseline	$0	0	NA	NA
Option 2 + P	35,573,746	5,128,793	$6.94	$6.94
Option 4	47,626,564	5,659,799	8.41	22.70
Subcategory K				
Baseline	0	0	NA	NA
Option 2 + P	38,998,615	3,830,011	10.18	10
Option 4	83,368,375	4,363,815	19.10	83

C. Results of Barrier to Entry Analysis for New Sources

As discussed in Section X.D, when establishing the NSPS level of control, EPA considers the barrier that compliance costs due to the effluent guidelines regulation pose to entry into the industry for a new facility. The barrier to entry analysis compares estimated average incremental facility or company capital costs incurred to meet the effluent guidelines to average total assets of existing facilities. Tables X.C–1 and X.C–2, below, provide the results of the facility level and company level ratios. The facility level ratio of capital costs to total assets ranges from 0.1 percent under Option 2 to 2.1 percent under Option 4 in Subcategories A through D, and from 0.4 percent under Option 2 to 7.8 percent under Option 4 in Subcategory K. Average capital costs of $3.0 million per facility in Subcategories A through D result in a 2.1 percent ratio and average capital costs of $3.1 million per facility in Subcategory K result in a 7.8 percent ratio. The company level ratio of capital costs to total assets ranges from 0.02 percent under Option 2 to 0.3 percent under Option 4 for red meat, and from 0.1 percent under Option 2 to 1.7 percent under Option 4 for poultry companies. EPA notes that companies may own both red meat and poultry facilities across more than one subcategory. Poultry companies show the larger impacts as compared to red meat and mixed meat companies.

TABLE X.C–1.—SUMMARY OF FACILITY LEVEL RATIO OF CAPITAL COSTS TO ASSETS (BARRIER TO ENTRY)

[In percent]

Subcategory	Option 2	Option 2.5	Option 2.5 + P	Option 4
A–D	0.1	1.2	1.6	2.1
K	0.4	1.5	1.7	7.8

Note: Percentages are based on those facilities for which EPA had asset data and compliance costs.

TABLE X.C–2.—SUMMARY OF COMPANY LEVEL RATIO OF CAPITAL COSTS TO ASSETS (BARRIER TO ENTRY)

[In percent]

Subcategory	Option 2	Option 2.5	Option 2.5 + P	Option 4
Red Meat	0.02	0.2	0.3	0.3
Poultry	0.1	0.4	0.6	1.7
Mixed Meat	0.0	0.2	0.2	0.3

Note: Percentages are based on those companies for which EPA had complete asset data and compliance costs.

XI. Solicitation of Comment

The following discussion summarizes some of those issues raised by new information and comments on the proposal for which EPA is requesting comment. Other solicitations for information, data, or comment are contained within the text of the notice. Note that several of the solicitations for comment/data below have not been previously discussed elsewhere in this NODA.

1. Concentration-based limits. EPA proposed to set mass-based limitations and standards (*e.g.,* kg/1,000 kg live weight killed). Based, however, on comments received on the proposed rule, EPA is considering setting concentration-based limitations and standards in the final rule. EPA is considering such limitation rather than limiting facility flows, and, as a result, potentially hindering their ability to reduce pathogens that can cause foodborne illness. Use of concentration-based limitations would also obviate the need for facilities to report production data when applying for coverage under an NPDES permit and the necessity for the permit writer to establish a reasonable measure of long-term production that applies to a particular facility. EPA solicits comment on this issue. EPA is particularly interested in comments on whether adoption of such concentration limitations rather than mass-based limitations is appropriate in light of the Agency's expressed interest in conservation of water. EPA notes that it has already received and is evaluating comments on the proposed rule concerning increased water usage as a result of the implementation of USDA's Hazard Analysis and Critical Control Point (HACCP) systems final rule.

2. Combining of poultry subcategories. EPA is considering combining the proposed Poultry Slaughtering and Poultry Further Processing subcategories into one subcategory. EPA currently identified only one stand-alone poultry further processing facility. This facility is employing more advanced wastewater treatment technology than most facilities in the Poultry Slaughtering subcategory. EPA notes that in addition to using data from poultry slaughtering facilities, the limits for Subcategory K were developed using facilities that were treating further processing and rendering wastewater in addition to their slaughtering wastewater. Therefore, EPA believes that the data for Subcategory K may reasonably characterize the treatability of Subcategory L wastewater and is considering combining subcategories K and L into one subcategory for the final rule. EPA solicits comment on this approach.

3. Chemical or Biological Phosphorus Removal. EPA has based its cost module for phosphorus removal on the chemical removal of phosphorus using alum. However, there are facilities using biological phosphorus removal including one poultry facility which EPA is using to develop limitations. However, EPA has determined that it is unlikely that biological phosphorus removal (without the use of a chemical removal polishing step) would consistently achieve the target effluent concentrations that EPA is currently projecting for chemical phosphorus removal. EPA solicits comment and data on treatability of poultry or red meat wastewater using biological phosphorus removal as well as data on the associated costs. EPA also requests comment on developing limitations for the final rule based on performance of biological phosphorus removal, in order to provide greater compliance flexibility to facilities.

4. Filters and Storage Ponds. EPA received comment concerning the achievability of the proposed limits and the need for either filters or ''emergency'' storage ponds to consistently achieve the total suspended solids limits. EPA is considering whether costs for polishing filters or additional storage/diversion capacity may need to be included for one or more options or subcategories. EPA has received some information regarding the number of red meat facilities that may have ''emergency'' storage ponds. EPA is specifically considering whether or not to include costs for such a storage pond to receive wastewater prior to discharge when the TSS limits have not been achieved through an existing ''BAT'' or ''BPT'' treatment system. EPA intends to perform a sensitivity analysis to estimate additional costs for those sites that currently do not have this capacity. EPA is also considering adding costs for a polishing filter. EPA solicits comments and data on the performance of storage/diversion ponds and filters for polishing final effluent at red meat or poultry facilities and the associated costs.

5. BOD to TKN Ratio. EPA has worked with stakeholders during the development of the revised cost model discussed in Section III of today's notice. EPA is using a BOD to TKN ratio of 3 to 1 in designing the denitrification treatment. Stakeholders commented that this ratio is too low. EPA calculated this ratio from information in comments from industry, where EPA converted a COD to TKN ratio to a BOD to TKN ratio and then built in an additional safety margin. Specific details regarding this conversion can be found in the cost report, DCN 100782. To further investigate this issue, EPA is soliciting influent and effluent data from the direct discharge detail survey facilities

who are currently employing denitrification technology. This would enable EPA to calculate the actual BOD to TKN ratio for each subcategory for use in the final rule. EPA would specifically like monitoring data from the influent to the biological treatment system for BOD and TKN and information on the level of denitrification that is occurring in the system (*e.g.*, data on Total Nitrogen at the influent and effluent or nitrate+nitrite at the influent and effluent of the system).

6. Lagoon Bypass. As discussed in Section III, EPA has estimated costs for facilities to bypass some of the wastewater around the anaerobic lagoons if data indicated that the concentration of BOD leaving the anaerobic lagoon is not at least three times the concentration of TKN. Stakeholders reviewing EPA's cost model commented that EPA underestimated the costs for lagoon bypass. EPA's cost estimates were based on the lagoon bypass observed at one of the facilities EPA has sampled which may be less complex than the lagoon bypass discussed by commenters. EPA solicits comment on the capital and operating and maintenance costs associated with less complex and more complex systems used to bypass anaerobic lagoons.

7. Use of Methanol as Carbon Source. EPA includes costs, as necessary, for facilities to use methanol on weekends (when the plant is not in operation) as a carbon source for the biomass. Commenters are concerned that methanol would cause biomass upset if the biomass is not acclimated to it. EPA does not believe that the quantity of methanol that it estimates to be used over the weekends is sufficient to cause toxicity to the biomass. EPA solicits comment on the quantity of methanol found to be ''toxic'' to biological systems used to treat red meat and poultry processing wastewater.

8. EPA received a request from permitting authorities to clarify the distinction between animal feeding operations (AFOs)/CAFOs and animal holding areas in the MPP industry. Animal holding areas at MPP facilities where animals are held for short durations (one to several days) prior to slaughter are not considered AFOs, but rather are considered part of the MPP facility and any process wastewater from these areas is subject to MPP effluent guidelines. EPA solicits comment on an approach that would articulate these clarifying points in the regulatory text of the Meat and Poultry Products ELG. (*See* Section V.A for the relevant discussion.)

9. EPA is considering revising the existing and proposed limitations and standards for fecal coliforms to allow for results to be reported in either MPN units or CFU units per 100 ml. EPA solicits comment on this possible revision. (*See* Section V.C for the relevant discussion.)

10. Some facilities use ultraviolet (UV) technology to disinfect their wastewater before discharge instead of using chlorine or other chemical disinfectants. EPA intends to further review sampling episode data and to consider the self-monitoring data from facilities that use UV technology. EPA solicits comments and data on UV performance and costs for reducing fecal coliforms in MPP wastewaters. EPA also solicits comment on the extent to which water quality standards are driving the MPP industry to shift from chlorination/dechlorination to UV to achieve water quality standards for chlorine and chlorination byproducts and whether this shift necessitates a revised fecal coliforms limit that is consistently achievable with UV technology. (*See* Section V.C for the relevant discussion.)

11. EPA is considering using five forecasting methods when determining facility closures for the final rule. A facility would be projected to close if the present value (PV) of future compliance costs exceeds the forecast PV of net income under three of the five forecasting methods. Alternately, EPA might use some subset of the five forecasting methods. EPA solicits comment on the appropriate use of these forecasting methods for future facility income in the MPP industry. (*See* Section VI.A.1 for the relevant discussion.)

12. Because fewer than 40 percent of direct discharging facilities provided facility-level financial data in the detailed survey, EPA is considering a closure analysis at the company level in addition to the facility level. EPA solicits comment on the aggregation of facility-level compliance costs to the company level, and the use of a company-level closure analysis. In addition, EPA solicits comment on the methodology used to estimate compliance costs for the closure analysis for the 70 non-surveyed facilities which are owned by the same parent companies as the 55 detailed survey recipients. (*See* Section VI.A.3 for the relevant discussion.) EPA also solicits comment on appropriate methods for ''scaling-up'' the facility-level and company-level closure analyses to provide national projections given that there are sufficient data to analyze only a subset of facilities/companies.

13. To address commenters' concerns about the effect of the proposed rule on poultry exports, EPA derived its trade elasticities based on Armington's framework in which one country's meat products are an imperfect substitute for those of other countries. EPA solicits comment on its revised trade elasticity methodology. (*See* Section VI.B for the relevant discussion.)

14. Based on public comments received on the proposed rule, EPA is considering possible revisions to its approach for determining environmental benefits. For modeling water quality, EPA solicits comment on the use of the six-parameter Water Quality Index (instead of the four-parameter Index) to assess the environmental improvements from the MPP regulation. In particular, EPA solicits comment on the inclusion of nitrogen and phosphorous in the kinetics model. EPA also solicits comment on the use of NAWQA data to calibrate the baseline, and solicits other sources of data to use in the calibration effort. (*See* Section VII.A.1 for the relevant discussion.)

15. EPA is considering site-specific or watershed-specific models to evaluate the effects of nutrients and pollutants on receiving waterbodies from individual representative MPP facilities. EPA solicits comment on the applicability of the AQUATOX, QUAL2E and BASINS models to model the environmental benefits of the MPP regulation. (*See* Section VII.A.2 for the relevant discussion.)

16. EPA solicits comment on the use of Mitchell and Carson's valuation function for estimating the monetized benefit for the MPP industry. If more site-specific valuation information becomes available, EPA may decide to incorporate those site-specific values for estimating the monetized benefit. (*See* Section VII.B.1 for the relevant discussion.)

17. EPA solicits comment on its approach to estimating monetized benefits associated with reduced TSS concentrations at drinking water intakes. (*See* Section VII.D.1 for the relevant discussion.)

18. EPA solicits comment on the use of a regional vulnerability assessment for the MPP environmental assessment. (*See* Section VII.D.3 for the relevant discussion.)

19. EPA did not use data from two pre-proposal sampling episodes (6335 and 6446) in its analyses presented in today's notice. EPA solicits comment on the potential use of data from Episodes 6446 and 6335 for use in developing pollutant loading estimates and limitations and standards for the final

rule. (*See* Section VIII.A.2 for the relevant discussion.)

20. EPA is considering reducing the assumed monitoring frequency from daily to weekly for any new limitations and standards promulgated in this rulemaking. EPA incorporated a weekly monitoring frequency into the monitoring costs for this notice. EPA solicits comment on changing the monitoring frequency to weekly. (*See* Section VIII.B for the relevant discussion.)

21. EPA solicits comment on a no further regulation option for red meat processing facilities and a no regulation option for poultry processing facilities (*See* Section IX.B for the relevant discussion).

22. For developing the estimates of compliance costs and pollutant loadings presented in today's notice, EPA transferred the target effluent concentration for Total Nitrogen from well-operated facilities at the Option 2.5 level that slaughter poultry (Subcategory K) to red meat facilities in Subcategories A–D. EPA solicits comment on this data transfer from poultry to meat slaughtering for the final rule. (*See* Section V.D for the relevant discussion.)

23. When establishing the New Source Performance Standard (NSPS) level of control, EPA considers the potential barrier that compliance costs due to the effluent guidelines regulation pose to new facilities entering the industry. The barrier to entry analysis compares estimated average incremental facility or company capital costs incurred to meet the effluent guidelines to average total assets of existing facilities or companies. The ratio of average capital costs to average total assets is a proxy for potential barriers to entry due to the MPP rule. EPA solicits comment on other measures of ''barrier to entry'' that would be appropriate for this industry. (*See* Section X.D for relevant discussion.)

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G. Tracy Mehan, III,

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