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Notice of Data Availability; Proposed Rule

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 122 and 412

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Notice of Data Availability; National Pollutant Discharge Elimination System Permit Regulation and Effluent Limitations Guidelines and Standards for Concentrated Animal Feeding Operations

AGENCY: Environmental Protection Agency (EPA).

ACTION: Proposed rule; Notice of data availability.

SUMMARY: On January 12, 2001 (66 FR 2959), EPA published a proposal to revise and update two regulations that ensure manure, wastewater, and other process waters generated by concentrated animal feeding operations (CAFOs) do not impair water quality. These two regulations include the National Pollutant Discharge Elimination System (NPDES) provisions that define which operations are CAFOs and establish permit requirements, and the Effluent Limitations Guidelines (ELG), or effluent guidelines, for feedlots (beef, dairy, swine and poultry subcategories), which establish the technology-based effluent discharge standards for CAFOs. EPA proposed revisions to these regulations to address changes that have occurred in the animal industry sectors over the last 25 years, to clarify and improve implementation of CAFO permit requirements, and to improve the environmental protection achieved under these rules.

In the proposal, EPA specifically solicited comment on 28 issues (66 FR 3133), in addition to a general comment solicitation on all aspects of the proposed regulations. EPA received comments from various stakeholders, including State, Tribal and Federal regulatory authorities, environmental groups, industry groups, land grant university researchers, and private citizens. This document presents a summary of certain data received in comments since the proposal and describes how these data may be used by EPA in developing its final CAFO regulations.

Due to the comments and data received, EPA is considering changes to certain aspects of the proposed CAFO rule, including changes to the technology options considered for regulation, as well as changes to the underlying data and methodology that EPA uses to estimate the costs and financial impacts associated with the regulation. Today, EPA is making these data and comments available for public review and comment. EPA solicits public comment on any of the issues or information presented in this notice of data availability and in the administrative record supporting this document.

DATES: You must submit comments by January 15, 2002.

ADDRESSES: Public comments regarding this document should be submitted electronically to CAFOS.comments@epa.gov. Electronic comments must specify docket number W–00–27 and must be submitted as an ASCII, Word, or WordPerfect file avoiding the use of special characters and any form of encryption. Electronic comments on this action may be filed online at many Federal Depository Libraries. No confidential business information (CBI) should be sent via e-mail.

You also may submit comments by mail to: Concentrated Animal Feeding Operation Proposed Rule, Office of Water, Engineering and Analysis Division (4303), USEPA, 1200 Pennsylvania Avenue, NW., Washington, DC 20460. Hand deliveries (including overnight mail) should be submitted to the Concentrated Animal Feeding Operation Proposed Rule, USEPA, Waterside Mall, West Tower, Room 611, 401 M Street, SW., Washington, DC 20460. Please submit an original and three copies of your written comments and enclosures, as well as any references cited in your comments. Commenters who want EPA to acknowledge receipt of their comments should enclose a self-addressed, stamped envelope. No facsimiles (faxes) will be accepted.

The public record for this action and the proposed rulemaking has been established under docket number W–00–27 and is located in the Water Docket East Tower Basement, Room EB57, 401 M Street SW., Washington, DC 20460. The record is available for inspection from 9:00 a.m. to 4:00 p.m., Monday through Friday, excluding legal holidays. For access to the docket materials, call (202) 260–3027 to schedule an appointment. A reasonable fee may be charged for copying.

FOR FURTHER INFORMATION CONTACT: Renee Selinsky Johnson, Paul Shriner, or Karen Metchis at (202) 564–0766. You may also e-mail the above contacts at johnson.renee@epa.gov, shriner.paul@epa.gov, and metchis.karen@epa.gov.

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I. Purpose of This Document

In today's document, EPA presents a summary of new data and information submitted to EPA during the public comment period on the proposed CAFO regulations, including data received from the U.S. Department of Agriculture (USDA). There are four main components to this notice: (1) Discussion of new data and changes EPA is considering to refine its cost and economics model, (2) discussion of new data and changes EPA is considering to refine its nutrient loading and benefits analysis, (3) new data and changes EPA is considering to the proposed NPDES permit program regulations, and (4) new data and changes EPA is considering to the proposed ELG regulations. This notice addresses these and other issues related to the proposed CAFO regulations. To the extent possible, today's notice describes new analyses that may be performed by EPA and describes revisions that EPA is considering to its financial and engineering models, as well as new data or methodologies that EPA is considering.

This notice also discusses ways that EPA is considering to enhance flexibility for the use of State NPDES and non-NPDES CAFO programs, including options to encourage implementation of environmental management systems (EMS). The notice also describes regulatory thresholds that are being considered for operations that raise ducks and horses, and addresses how cow/calf pairs could be counted. The notice also describes new information received by EPA on the proposed CAFO performance standards.

New data that EPA is considering for use in its cost and economic models include estimates of technology adoption across a range of livestock and poultry operations, financial data specified at the livestock enterprise level only, and new information pertaining to various modeling assumptions used by EPA. Among the specific issues addressed in the discussion of how the Agency is considering to refine its cost and economic models are: expansion of the range of cost estimates per representative farm to account for variability across operations; addition of alternative assessment criteria to measure changes in profitability (post-compliance); new financial data to supplement available data at the farm level with data at the enterprise level; revision of the criteria threshold on a debt-asset test and other considerations of debt feasibility; and consideration of approaches to account for various cost offsets. Specific issues addressed in the discussion of how the Agency is considering to refine its nutrient loading and benefits analysis include: expansion of the number of representative farms to measure changes in nutrient loadings; and the addition of monetized benefit estimates from changes in air emissions. Other new data submitted to EPA include: estimates of the number of animal feeding operations and CAFOs; new information pertaining to the number of CAFOs that are small businesses; estimates of manure nutrient loadings and crop uptake needs; and USDA estimates of the amount of manure addressed by the regulations at different regulatory thresholds.

Through this notice of data availability, EPA is seeking further public comment on any and all aspects of the specific data and issues identified in this notice. However, EPA is seeking public comment *only* on these specific data and issues. Nothing in today's notice is intended to reopen any other issues discussed in the CAFO proposal or to reopen the proposal in general for additional public comments. EPA is continuing 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 notice, in the final rulemaking.

II. Public Outreach and Data Gathering

A. Overview of Pre-Proposal Outreach

During the development of the proposed regulations for CAFOs, EPA met with various members of the stakeholder community through meetings, conferences, and site visits. EPA convened a Small Business Advocacy Review Panel to address small entity concerns, provided outreach materials to and met with several national organizations representing State and local governments, and conducted approximately 110 site visits to collect information on waste management practices at livestock and poultry operations. EPA also established a

workgroup that included representatives from USDA, seven states, EPA regions, and EPA headquarters.

More detailed information on EPA's public outreach were published in Section XII of the **Federal Register** notice for the proposed rule (66 FR 3120, January 12, 2001).

B. Post-Proposal Activities

Following proposal of the rule, EPA has encouraged public participation through a series of public meetings, meetings with stakeholders and USDA representatives, and other activities described below.

1. Public Meetings

EPA conducted nine public meetings on the proposed CAFO regulations. Public meetings were held in: Baltimore, Maryland; Ames, Iowa; Riverside, California; Fort Wayne, Indiana; Dallas, Texas; Chattanooga, Tennessee; Denver, Colorado; Boise, Idaho; and Casper, Wyoming. The purpose of the meetings was to enhance public understanding of the proposed regulations for CAFOs and provide an opportunity for EPA to answer questions on the rule directly and to obtain informal feedback on the proposed requirements. The meetings consisted of a brief presentation by EPA officials on the proposed regulation followed by a question and answer session. Additional information on EPA's public meetings is available in the record and also at EPA's website at: http://www.epa.gov/npdes/afo. This website provides summaries of these public meetings and a copy of the presentation materials used at these public meetings, along with additional information on EPA's outreach activities following proposal.

2. Stakeholder Meetings

Since the proposal, EPA has met with representatives of various stakeholder groups, including representatives from various industry trade associations, environmental groups, as well as researchers from select land grant universities and research organizations, including Food and Agricultural Policy Research Institute. Throughout regulatory development, EPA worked with representatives from the national trade groups, including: National Cattlemen's Beef Association; American Veal Association; National Milk Producers Federation; Professional Dairy Heifers Growers Association; Western United Dairymen; National Pork Producers Council; United Egg Producers and United Egg Association; National Turkey Federation; the National Chicken Council; the American Horse Council; and representatives of the duck industry.

EPA has also consulted with State and local governments and also several national associations representing State governments. These include the National Governors' Association, the National League of Cities and the National Association of Conservation Districts and the Association of State and Interstate Water Pollution Control Agencies. Other state level organizations that the Agency has consulted with include the Delaware Nutrient Management Commission, Quad State Poultry Dialogue, National Association of State Departments of Agriculture, and the National Association of State Conservation Agencies. The purpose of these meetings was to provide clarification of the proposed regulations and the analyses supporting the development of these proposed regulations, as well as to discuss new information that stakeholders may have available for further analyses of the costs, impacts, and benefits of the proposed rules. These meetings typically focused on a specific regulatory or technical topic (e.g., permit nutrient plans, EPA's cost analysis supporting the proposal) or a specific animal sector (e.g., dairies). Additional documentation of these stakeholder meetings is available in the rulemaking record.

3. USDA–EPA Workgroup Meetings

In April 2001, USDA initiated a process to review the proposed revisions to EPA's CAFO rule and identify issues and concerns posed by the rule. USDA identified 15 specific areas of concern and a number of overarching issues. As a follow-up to this process, USDA and EPA's Office of Water initiated monthly meetings on issues of significance for agriculture and the environment, specifically water quality. The goal was to improve communication between the two agencies to provide better information to the public and policy makers on areas of mutual concern related to agriculture and water quality, and to facilitate informed decisions on approaches and needs to address the key agriculture and environment issues. In July 2001, EPA and USDA convened a joint workgroup to address the issues identified by the USDA workgroup and begin to develop options for EPA leadership to consider in developing the final rule. The collaboration is intended to strengthen the agricultural systems view in the analysis used to finalize the proposed CAFO rule.

The USDA–EPA workgroup is charged with developing an approach to pursue discussions between the two agencies. The focus of this dialogue is on the issues identified through USDA's review of the proposed revision to the CAFO rule, including identifying additional data or information needs to support analyses and identifying potential options that could be considered by EPA for consideration in its decision-making process. Four major broad topic areas were discussed by the USDA–EPA workgroup, including (1) EPA's proposed scope of the CAFO regulations, (2) EPA's cost and economic analysis supporting the proposed regulations, (3) EPA's proposed technology options, and (4) EPA's proposals for building State program flexibility into the regulations.

USDA's participation in these discussions is to identify issues, suggest strategies or approaches to resolve issues, and provide data and information to support additional analysis. EPA's participation in these discussions is to clarify the intent of sections giving rise to issues, identify additional data or information needed, and thoughtfully assess the information provided by USDA for use in finalizing the CAFO rule. As part of this process, USDA recognizes that the authority to develop the final CAFO regulations rests solely with EPA, as does the final responsibility for the content of the rule.

4. Review of EPA's Economic Analysis by the Food and Agricultural Policy Research Institute (FAPRI)

Researchers at the Food and Agricultural Policy Research Institute (FAPRI) at University of Missouri conducted a review of EPA's economic analysis at the request of the Committee on Agriculture, United States House of Representatives. To respond to this Congressional request, the FAPRI staff worked with other members of its consortium, including researchers at Iowa State University and the Agriculture and Food Policy Center (AFPC) at Texas A&M University.

The stated focus of FAPRI's review is to provide EPA with an alternative methodology for determining the financial impacts of the proposed CAFO regulations on the livestock industry. FAPRI's review did not specifically address technical aspects of the proposed requirements or EPA's data and methodology to estimate compliance costs associated with the management of animal effluents. To that end, FAPRI assembled agricultural and land grant university experts to help conduct an independent economic analysis and construct alternative models of animal feeding operations for use in this analysis. Once alternative

financial information was compiled, FAPRI designed an alternative economic model to first construct a financial baseline for each operation and then analyze the impact of the proposed CAFO regulations. FAPRI's study also predicted the aggregate level impacts in each of the livestock sectors due to implementation of the proposed CAFO regulations. For this study, FAPRI used cost estimates directly computed by EPA, with some exceptions made by FAPRI to improve the accuracy of these cost estimates.

FAPRI's reports on EPA's cost and economic analysis, ''FAPRI's Analysis of the EPA's Proposed CAFO Regulation'' and also ''Financial Impact of Proposed CAFO Regulations on Representative Broiler Farms'' are available in the record and at FAPRI's website at: http://www.fapri.missouri.edu/FAPRI_;Publications.htm. Additional detailed information about FAPRI's baseline model is available at http://www.fapri.missouri.edu.

5. Other Outreach and Data Gathering

EPA initiated several other means of providing outreach to stakeholders. Most notably, EPA manages a number of web sites that post information related to these regulations. Supporting documents for the rule include the Technical Development Document, Economic Analysis, Environmental Assessment, Environmental and Economic Benefit Analysis of the proposed CAFO regulations, and cost methodology reports and guidance related to Permit Nutrient Plans. These are located at http://www.epa.gov/waterscience/cafo/. Other outreach materials are located at http://www.epa.gov/npdes/afo/ and include a copy of the public meeting presentation materials, a fact sheet describing the proposed CAFO regulations, a compendium of AFO-related State program information, and various materials related to permitting issues.

In response to the public meetings, EPA developed a document entitled ''Frequently Asked Questions About the Proposed Revisions to CAFO Regulations'' published on June 27, 2001 and available on the outreach web site. This document identifies the major issues raised during the public meetings and provides brief answers for each question. EPA also developed a Public Commenter's Guide to the Proposed New CAFO Regulations, published on May 31, 2001. The Guide identifies the major issues in the proposal and summarizes how EPA has proposed to treat each issue in the revised regulations. The Guide also provides a cross reference list of the proposed regulatory language and the location of associated discussion in the preamble. This information is available at: http://www.epa.gov/npdes/afo/.

III. Summary of the Proposed ELG and NPDES Rules

The proposed rule, published on January 12, 2001 (66 FR 2959), identified potential revisions to existing NPDES permit provisions and effluent guidelines for CAFOs. The NPDES permit program for CAFOs defines which animal feeding operations are CAFOs and need to obtain a NPDES permit, and establishes the specific compliance requirements under a permit. Effluent guidelines and standards for CAFOs establish the technology-based effluent discharge and performance standards for both existing and new facilities for each of the beef, dairy, veal, swine and poultry subcategories.

In developing its proposed CAFO regulations, EPA considered various technology options and also different options in terms of the number of regulated operations. A summary overview of the ELG options and NPDES scenarios is provided in Table 3–1. For more detailed information, see Sections VII and VIII of the EPA's proposed rulemaking preamble (66 FR 2993–3061).

TABLE 3–1.—SUMMARY DESCRIPTION OF OPTIONS/SCENARIOS CONSIDERED BY EPA

Technology Options
Option 1: N-based land application controls and inspection and recordkeeping requirements for the production area.
Option 2: Same as Option 1, but restricts the rate of manure application to a P-based rate where necessary (depending on specific soil conditions at the CAFO).
Option 3: Adds to Option 2 by requiring the operation to perform ground water monitoring and controls, unless it can show that the ground water beneath manure storage areas or stockpiles does not have a direct hydrologic connection to surface water.
Option 4: Adds to Option 3 by requiring sampling of surface waters adjacent to production area and/or land under control of the CAFO to which manure is applied.
Option 5: Adds to Option 2 by establishing a zero discharge requirement from the production area that does not allow for an overflow under any circumstances.
Option 6: Adds to Option 2 by requiring that large hog and dairy operations install and implement anaerobic digestion and gas combustion to treat their manure.

TABLE 3–1.—SUMMARY DESCRIPTION OF OPTIONS/SCENARIOS CONSIDERED BY EPA—Continued

Option 7: Adds to Option 2 by prohibiting manure application to frozen, snow covered or saturated ground.
Regulatory Scope Options
Scenario 1: Retains existing 3-tier framework and establishes additional requirements.
Scenario 2: Same as Scenario 1; except that operations with 300–1,000 AU would be subject to the regulations based on a revised set of conditions at the feedlot site.
Scenario 3: Same as Scenario 2, but allows operations with 300–1,000 AU to either apply for a NPDES permit or to certify to the permit authority that they do not meet any of the conditions and thus are not required to obtain a permit.
Scenario 4a: Establishes 2-tier framework and applies ELG standard to all operations with more than 500 AU.
Scenario 4b: Establishes 2-tier framework and applies ELG standard to all operations with more than 300 AU.
Scenario 5: Establishes 2-tier framework and applies ELG standard to all operations with more than 750 AU.
Scenario 6: Retains existing 3-tier framework and establishes a simplified certification process.

A. Proposed Effluent Limitations Guidelines and Standards (ELG)

Under the current regulations, CAFOs are already prohibited from discharging process wastewater, except when rainfall events cause an overflow from a facility designed, constructed, and operated to contain all process-generated wastewater plus the runoff from a 25-year, 24-hour rainfall event. Under Option 1, CAFOs would also be required to implement certain best management practices and inspection and monitoring requirements for the production area. Option 1 would also require that land application of manure and wastewater be performed in accordance with a permit nutrient plan that establishes application rates based on crop nitrogen requirements. Option 2 is equal to Option 1, with the exception that application rates would be restricted to phosphorus-based rates where necessary.

Option 3 includes all requirements of Option 2, and would require ground water monitoring and controls unless the CAFO has demonstrated that there is not a direct hydrologic connection between the ground water beneath the production area and surface water. Option 4 includes all requirements of Option 3, with an additional requirement to monitor surface waters adjacent to feedlots and to CAFO cropland to which manure may be

applied that is under control of the CAFO. Option 5 includes all requirements of Option 2, and prohibits overflow from the CAFO production area under any circumstances. Option 6 includes all requirements of Option 2 and requires that large hog and dairy operations install and implement anaerobic digestion to treat manure and capture methane gas for energy or heat generation. Option 7 includes all requirements of Option 2 and prohibits manure application to frozen, snow covered, or saturated ground.

In developing the proposed regulations, EPA assembled information and data on each of the seven technology options considered. This information was used to identify the preferred technology option for each industry subcategory.

For existing operations, EPA proposed to require nitrogen-based and, where necessary, phosphorus-based land application controls of all livestock and poultry CAFOs (Option 2), with the additional requirement that all cattle and dairy operations must conduct ground water monitoring and implement controls, unless they demonstrate that the ground water beneath the production area does not have a direct hydrologic connection to surface water (Option 3), and with the additional requirement that all hog, veal, and poultry CAFOs must also achieve zero discharge from the animal production area with no exception for storm events (Option 5).

For new operations, EPA proposed that operations meet the same requirements that would apply to existing operations based on BAT (Option 3 and Option 5), with the additional requirement that all new hog, veal and poultry operations also would need to implement ground water controls unless they demonstrate that there is no direct hydrologic connection to surface water (Option 3).

In addition, EPA's proposed regulations would make the ELG applicable to all operations defined as a CAFO under the NPDES regulation (not including operations that are *designated* as a CAFO), as well as to establish a new subcategory for veal production. EPA proposed substantial changes to the applicability for chickens, mixed animal operations, and immature animals. EPA also proposed to rename the effluent guidelines regulation from Feedlots Point Source Category to CAFOs Point Source Category.

For more detailed information on these proposed technology options, see Section VIII of the EPA's proposed rulemaking preamble (66 FR 3050–3061).

B. Proposed NPDES Regulations

At proposal, EPA presented seven potential scenarios that differ in the number of operations that would be affected by the proposed regulations (see Table 3–1). Under the existing regulations for CAFOs, animal feeding operations with more than 1,000 animal units (AU) are defined as CAFOs and must obtain a NPDES permit. In addition, operations with between 300 AU and 1,000 AU may be defined as CAFOs, if they meet certain criteria (see 40 CFR 122.23 and Part 122, Appendix B).

Under the proposed revisions, EPA considered a number of alternatives to the existing CAFO definition. The ''two-tier'' structure would define as CAFOs all animal feeding operations with more than a specified number of animals. Operations with fewer animals would become a CAFO only if designated by EPA or the permit authority. Various two-tier alternatives considered by EPA included defining as CAFOs all animal feeding operations with more than 300 AU, 500 AU, 750 AU or 1,000 AU. The ''three-tier'' structure would define as CAFOs all animal feeding operations with more than 1,000 AU and any operation with more than 300 AU if they meet certain conditions at the feedlot site—and, under one alternative, would require all operations with between 300 and 1,000 AU to either apply for a NPDES permit or to certify to the permit authority that they do not meet certain conditions and thus are not required to obtain a permit. These alternatives are presented in Table 3–1.

EPA co-proposed two structures for defining which animal feeding operations (AFOs) are CAFOs. In the first alternative, EPA proposed to replace the existing three-tier structure with a simplified two-tier structure that defines a CAFO based on size alone. For this approach, EPA proposed to set the size threshold for CAFOs at 500 AU (see Table 3–1, Scenario 4a); EPA also requested comment on establishing the threshold at 750 AU (Scenario 5). In the second alternative, EPA proposed to retain the existing three-tier structure, but to revise the conditions that define a CAFO in the middle tier, and to require all middle-tier operations to either apply for a NPDES permit or to certify that they do not meet the conditions for being considered a CAFO (Scenario 3). EPA also requested comment on a three-tier structure with simplified conditions.

In addition, EPA proposed to revise the definition of a CAFO to include poultry operations, stand-alone swine nurseries, and stand-alone heifer operations. The definition of a CAFO would also specifically encompass both the production area and land application area. The definition of an AFO would be revised to clarify that animals are not ''stabled or confined'' when they are in areas such as pasture or rangeland. EPA also proposed that NPDES permits would be required for all CAFOs, even if they only discharge in the event of a 25-year, 24-hour storm. This would include all CAFOs that discharge or have the potential to discharge CAFO wastes to navigable waters via ground water with a direct hydrologic connection.

EPA proposed two alternatives for information reporting in connection with the off-site transfer of excess manure. EPA also proposed that integrators be ''co-permitted'' where they exercise ''substantial operational control'' over the CAFO. As an alternative, EPA proposed waiving co-permitting where the State already has an adequate program to address excess manure or where the processor implements an adequate environmental management system.

EPA proposed that operations that cease to be CAFOs must retain NPDES permits until the facilities are properly closed. That is, the operation must remain permitted until all CAFO wastes no longer have the potential to reach waters of the United States.

For more detailed information on these proposed regulatory scope alternatives, see Section VII of the EPA's proposed rulemaking preamble (66 FR 2993–3050).

IV. New Information Related to the Proposed Revisions to the Effluent Limitations Guidelines and Standards

Since proposal, EPA has obtained additional data and information from the industry, USDA, State and local governments, other stakeholders, and the Agency's continued data collection activities. The Agency has included these data, information, and the preliminary results of EPA's evaluation in sections 14 through 23 of the rulemaking record, available for review in the Water Docket (Docket W–00–27; see Addresses section of this notice). The information includes data received by the Agency during the extended comment period on the CAFO proposal from the above sources, materials submitted by vendors, and materials collected by EPA during outreach and conferences. The specific technical data, information, and comments provided to EPA with respect to various specific issues are discussed throughout the following sections of this document.

A. Effluent Limitations Guidelines and Standards Terminology

As part of EPA's effort to develop national manure management standards, EPA has reviewed comments received on the proposal and worked closely with USDA in refining definitions of some terms contained in EPA's proposed regulatory language (see Section II.B.3). These refinements and alternatives along with comments received on this notice will be considered as the Agency develops the final rules. EPA solicits comments on the appropriateness of the following alternatives, the extent to which they need to become formalized definitions, and data sources used to support these terms.

1. Definition of Proper Agricultural Practices

In the proposal, EPA defined the term ''agricultural stormwater discharge'' with respect to land application of manure and wastewater from animal feeding operations. Under EPA's proposal, an ''agricultural stormwater discharge'' was defined as ''a discharge composed entirely of storm water, as defined in 40 CFR 122.26(a)(13), from a land area upon which manure and/or wastewater from an animal feeding operation or concentrated animal feeding operation has been applied in accordance with proper agricultural practices, including land application of manure or waste water in accordance with either a nitrogen-based or, as required, a phosphorus -based application rate'' (66 FR 3029). Within this definition, EPA used the term ''proper agricultural practices'' as part of defining what qualifies as an agricultural storm water discharge. EPA also used the phrase ''proper agricultural practices'' as part of an alternative proposal for the permit conditions for off-site transfer of manure for the purpose of land application (see 122.23 (a)(3)(ii)(B)(6)). It should be noted that under the proposal, the definitions of ''agricultural stormwater discharge'' and ''proper agricultural practices'' do not provide an exemption for a facility's duty to apply for a permit (see Section VII).

Several comments indicated manure could be used for conditioning of soils to promote soil structure and health, and can be so used for numerous land reclamation practices that some may not consider strictly agricultural. An example is using manure as a resource for reclamation of disturbed or spent lands. Some comments suggest this practice may have some distinct environmental benefits even if it is not strictly ''agricultural.'' EPA solicits comment on the application of manure to disturbed or spent lands, and the extent to which such practices result in discharges to surface waters.

To clarify the term as well as to ensure consistency within the rule, several stakeholders suggested ''proper agricultural practices'' should be formally defined in such a manner as to encompass necessary local practices to protect receiving streams from storm water runoff. EPA did not propose a regulatory definition of proper agricultural practices, but in accordance with these comments, is considering adopting the following definition of ''proper agricultural practices'':

A ''proper agricultural practice'' is one of any number of conservation practices, production measures, or management techniques that the CAFO operator or manure recipient can use to improve the efficiency, economy, or environmental condition of the site and surrounding land areas and waterbodies.

Examples of proper agricultural practices for control of CAFO-generated animal manures and wastewaters include, but are not limited to: adequate and proper storage for manures and wastewaters that facilitates timely and efficient land application practices; chemical/physical treatment of manures and wastewaters to stabilize nutrients in a manner that reduces loss to water and air; manure analysis; soil and plant testing to monitor soil nutrient levels and determine crop nutrient needs; calibration of manure spreaders and irrigation equipment; timely and efficient application of manures relative to nutrient uptake patterns and realistic yield goals of crops; crop management practices that optimize yields and plant nutrient uptake while minimizing nutrient losses to ground and surface waters; and tillage practices and other soil conservation measures that prevent soil erosion and nutrient leaching and runoff. What constitutes proper agricultural practices is a case-by-case decision that depends on the circumstances at each site and may necessitate a combination of one or more of the practices listed above or other practices not listed here.

EPA solicits comment on the proposed definition of ''proper agricultural practices'' and the extent to which the suggested definition reduces ambiguity.

2. Chronic Storm Event

The current effluent guidelines for CAFOs require zero discharge of process waste water pollutants to navigable waters, except that process waste pollutants in the overflow may be discharged to navigable waters whenever rainfall events, either chronic or catastrophic, cause an overflow of process waste water from a facility designed, constructed and operated to contain all process generated waste waters plus the runoff from a 25 year, 24 hour rainfall event for the location of the point source (see 40 CFR 412.13). EPA does not define chronic or catastrophic storm events in the current rule (see 40 CFR 412.11).

In EPA's proposed revisions to the effluent guidelines for the production areas for the beef and dairy subcategories, EPA proposed to retain this design standard. EPA did not, however, propose to define chronic or catastrophic storm events. EPA also proposed to remove the terms chronic and catastrophic from the regulations. In the proposal, EPA noted persistent rainfall over a period longer than 24 hours can occasionally overwhelm a system designed for the 25 year 24 hour storm event even though such persistent rainfalls may be expected to occur more frequently than every 25 years (see 66 FR 3042). In EPA's proposal, EPA solicited comment on whether EPA should define chronic events, and whether EPA should develop additional design specifications for handling chronic rainfall events.

Some stakeholders agreed chronic rainfall events could cause a discharge from a system that has been designed, constructed, maintained and operated to contain all process waste waters plus the runoff from a 25 year, 24 hour rainfall event. One analysis performed by the Texas Institute for Applied Environmental Research shows the return interval of the equivalent volume of the 25 year, 24 hour storm event from consecutive wet days occurs every 6 years. Despite the occurrence of such chronic events, none of the stakeholders indicated the volume of any resulting discharges, the extent to which such discharges reached surface waters, or whether such discharges were indeed occurring. EPA solicits comment on the extent to which chronic events cause discharges from the production areas that subsequently reach surface waters.

Some stakeholders requested EPA evaluate a technology option using larger storm events as the design standard, especially in systems that collect runoff in addition to direct precipitation. For example, under one suggested approach, surface impoundments would need to provide storage for 10 year chronic events, or a combination of chronic events plus the 25 year 24 hour storm event. EPA is soliciting comment on the consequences

of establishing design standards based on chronic events, such as standards that would significantly increase the size of manure storage systems, significant increases in costs to expand existing storage capacity, and potentially increased environmental risks of creating larger liquid impoundments. EPA also solicits comment on the extent to which potential CAFOs already have sufficient storage to accommodate chronic events. EPA further solicits comment on an approach for clarifying when a discharge is considered to be caused by ''chronic rainfall;'' whether clarification is needed to enable the operator and the permit authority to be assured that the lagoon is being properly constructed and managed; whether existing state requirements adequately capture chronic storm events while leaving capacity for the 25 year, 24 hour storm events; and whether technology guidelines or permitting regulations are necessary in either Section 412 or 122 to address discharges due to chronic rainfall.

3. Alternative Approach to Nutrient Management Planning

EPA proposed to specify which components of a Comprehensive Nutrient Management Plans (CNMP) would be required under the name ''Permit Nutrient Plan'' (66 FR 3065). Many stakeholders believe the term Permit Nutrient Plan, or ''PNP,'' may cause confusion despite EPA's efforts to clarify that it is not a new or additional plan, but rather the enforceable portions of a CNMP. In light of feedback EPA has already received, EPA is now considering a change in terminology under which the effluent guidelines would specify that, instead of a PNP, each CAFO must have a CNMP that includes, at a minimum, a number of specific components. By eliminating the term ''PNP'', EPA would hope to quell the confusion over terminology. This would be a change in terminology only, since EPA would specify as ''minimum measures of a CNMP'' the same components that EPA described in the proposal as required elements of a PNP.

B. Proposed Performance Standards

1. Ground Water Controls

EPA proposed that in the absence of a certification that there is no direct hydrologic link between ground water below the production area and surface waters, facilities must take ground water samples to demonstrate compliance with the no discharge requirement from the manure storage areas. Some stakeholders incorrectly interpret the ground water controls to apply to the entire production area, or to the land application areas. EPA is clarifying that the proposed performance standard for ground water in § 412.33 is intended to apply to any liquid manure storage areas (e.g., ponds, lagoons, pits) or uncovered solid manure storage areas (e.g. stockpiles). EPA did not intend for this requirement to apply to the temporary mounding of manure in cattle dry lots. EPA also reiterates it did not propose that the requirement of zero discharge to ground water that has a direct hydrologic connection to surface waters would apply to discharges at the land application areas. Several stakeholders stated that ensuring zero discharge to ground water is not technologically feasible with the technologies identified by EPA as best available technologies, i.e., synthetic and clay double liners. These stakeholders assert all lagoons, including those lined with clay and some synthetic materials, leak to some degree. EPA continues to believe that the information in the record supports the Agency's determination that the technology we identified as BAT (synthetic/clay double liners) will achieve a standard of zero discharge to ground water. At proposal, EPA also identified additional technologies that the Agency believes would achieve a zero discharge standard, including glass-lined steel tanks, above ground tanks, and new liquid-impermeable synthetic liners. Because these technologies are more expensive than synthetic/clay double liners, EPA did not identify them as BAT or analyze their economic impacts.

Nevertheless, in light of the comments and information received, EPA intends to reexamine whether synthetic/clay double liners are truly capable of achieving zero discharge to ground water, based on the information in the record, including any new information received since the proposal. If EPA concludes that this technology is not available to achieve zero discharge, EPA is considering two further ways to proceed. First, EPA may examine whether it can identify the alternative technologies described above (glass-lined tanks, above ground tanks and liquid-impermeable liners) as BAT technologies, after evaluating their economic impacts. (The proposal already contained information on their costs.) Based on this analysis, EPA could retain the zero discharge standard based on identifying these alternative technologies as BAT technologies.

Second, if EPA cannot identify any alternative technologies as best available technologies economically achievable, EPA may reevaluate the performance achievable using synthetic/clay double liners. If these materials cannot achieve zero discharge, EPA may consider adopting a performance standard based on their permeability. Literature information in the record, as reflected in regulations adopted by several States, indicates that these materials can, at the very least, minimize discharges and achieve a leakage rate of no more than 10^{-7} cm per second. EPA would generally reevaluate the technological availability and economic achievability of adopting this numeric standard as a BAT standard based on the performance and costs and economic impacts associated with this technology. EPA solicits additional comment on these issues. EPA is also considering a variation on the above alternative standard. If EPA adopts a numeric BAT standard such as 10^{-7} cm per second, EPA is considering an option where a facility could demonstrate compliance with this standard by demonstrating that when it was first constructed or last modified, it was built to NRCS conservation practice standards, including criteria and considerations for design, used in conjunction with the Agricultural Waste Field Handbook and other technical references. This option would be based on a determination that meeting the NRCS practice standards will ensure that the 10^{-7} cm per second standard will be met. Information on the NRCS practice standards is contained in the record. EPA solicits comment on this alternative approach as a performance standard applicable to all CAFOs. EPA further solicits comments on the extent to which the alternative approaches under consideration may reduce costs, remove burden, reduce uncertainty associated with assessments of hydrologic connections, and possibly reduce monitoring and reporting requirements.

At proposal, EPA solicited comment on an approach that would narrow the ground water sampling requirements to only those facilities located in areas with topographical characteristics that indicate the presence of ground water that is likely to have a direct hydrologic connection to surface waters (*e.g.*, sandy soils, karst topography, and shallow water tables). Despite its narrowed focus, this approach would retain the proposal's presumption of a direct hydrologic connection, but only for those operations located in sensitive areas; operations not located in sensitive areas could still be subject to ground water sampling requirements if the permitting authority deemed it appropriate. EPA is clarifying that an alternative approach would be to

include ground water sampling provisions in the effluent guidelines but not to presume that there is a direct hydrologic connection for any facility. Thus, the need for ground water sampling or an assessment would not be specified in the effluent guidelines but would be left to the discretion of the permitting authority in all cases. EPA solicits comment on this approach. Should ground water requirements be included in the final rule, EPA further solicits comment on the level of discretion that is appropriate in the application of such requirements.

2. Alternatives to Proposed 100-foot Setback

EPA proposed a manure application setback of 100 feet from surface waters, open tile drain inlets, sinkholes, and agricultural drainage wells (see proposed rule § 412.37). EPA intended such setbacks would provide an additional barrier for pollutants in the runoff from land applied manure. EPA also determined the setback would provide an additional measure to prevent trace amounts of metals, pathogens, and antibiotics in the manure from leaving the field with runoff. In the proposal, EPA acknowledged and continues to believe the most effective combination of setbacks and vegetated buffers will be site specific. EPA believes the appropriate site specific combination will depend, among other things, the type of vegetation present, the use of soil conservation practices in or adjacent to the setback, the consideration of slope in determining the potential risk to water courses, and the method and timing of manure and wastewater applications in the setback zone. EPA further solicited comment on EPA's concern that a setback from these select features might preclude manure based fertilization of large areas of crop land in certain geographic locations.

To evaluate the costs of this proposed requirement, EPA assumed facilities would establish vegetated buffers with a width of 100 feet on each side of any streams. EPA assumed the net loss of tillable land for facilities to establish these buffers as 3.5 percent of total crop land. EPA believed this approach could overstate the costs of requiring a setback, but would encourage vegetated buffers and other practices to supplement the setback. EPA solicited comment on the use of vegetated buffers or other management practices to minimize pollutants in the runoff from land application. EPA also solicited comment on how it might revise the setback requirement and still adequately protect water quality. Many stakeholders agreed the determination should be site specific, but most stakeholders did not provide any information to indicate that there are any other practices that would perform equal to or better than EPA's proposed setback requirement. Therefore, EPA continues to solicit comments on the proposed 100 foot setback requirement; specifically, as to whether any such superior practices exist. EPA reiterates that nothing in today's notice, including this section, is intended to reopen the proposal in general for further comment. EPA is seeking additional public comment only on the discrete issues identified in this notice. In this case, EPA is interested in further comments on this specific issue to see whether there is any additional information of which we are unaware. EPA solicits comment on whether there are any specific practices that could be established on a site specific basis that would perform as well as or better than EPA's proposed setbacks or buffers.

3. Manure Application Rates Based on Limiting Nutrients

EPA proposed the determination of manure application rates to crop land must, at a minimum, consider the limiting nutrient phosphorus (*See* proposed rule at § 412.31). Where phosphorus levels pose a low to medium risk, the limiting nutrient is typically nitrogen, although in certain cases other factors, such as salt concentrations, could limit manure application rates. EPA proposed the criteria for phosphorus-based management for CAFOs be those that are specified in each state's Nutrient Management Standard (NRCS Conservation Practice 590) so that the decision on the most effective approach(es) and the exact criteria and definitions (either agronomic soil test P levels, soil P thresholds, or the P Site Index) would be state specific.

At the time of proposal, EPA noted that several States already required animal feeding operations to develop nutrient management that consider phosphorus. Several stakeholders stated the nutrient management standards, especially the P-index, were not sufficiently developed to allow their implementation with EPA's final rule. Since proposal, most states have developed their P-index or a nutrient standard based on the P-index, as indicated in additional information that EPA has received from NRCS and is making available today. Since the proposal, 45 States have updated their Nutrient Management Standard; 44 States are using the P-index and one State is opting to use soil test P values. The remaining 5 States have been granted an extension by USDA to revise their Nutrient Management Standards. EPA solicits specific comment on this new information, on whether there is any other information indicating the extent to which States are already mandating phosphorus-based management of manure, and on the extent to which States are implementing their recently revised Nutrient Management Standards in newly written nutrient management plans. EPA intends to use the information received, and any new information, to reevaluate the existing or ''baseline'' requirements for P-based application under State law and the costs of complying with those requirements. Any change to the baseline costs and economic impacts could affect EPA's analysis of the overall economic impacts of the revised regulations.

Several stakeholders expressed concern that EPA was mandating phosphorus application rates for land application under all circumstances. Quite to the contrary, EPA's proposed use of NRCS'' recommended nutrient risk assessment tools contained in the Nutrient Management Standards (NRCS Conservation Practice 590) such as the P-index would allow application rates to be managed differently for each field. The phosphorus index considers many circumstances that affect nutrient transport from the field, and rates each field's potential for nutrient losses accordingly. For States using soil test levels as a screening tool, only fields with excessively high phosphorus levels would be required to undergo the development of a more rigorous phosphorus-based strategy. While EPA's approach may limit land application to phosphorus-based rates on some fields, particularly those fields that have received manure every year for decades, other fields could continue to receive manure at a nitrogen rate.

Some comments suggest EPA's proposal is too prescriptive by requiring one of three methods for phosphorus-based management. Indeed many stakeholders in academia feel nutrient management is continuously evolving in each State. These stakeholders felt EPA should allow for other State-approved nutrient management standards based on the Nutrient Management Standard, such as the PLAT (phosphorus loss assessment tool) under development in North Carolina. PLAT is intended for application on a field-by-field basis as part of the nutrient management planning process. This tool will rate each site as low, medium, high, or very high. Based on this site-specific assessment, phosphorus may be

identified as the ''limiting'' nutrient in the development of the specified nutrient application rate being developed by North Carolina.

EPA continues to consider other nutrient management approaches developed by States while maintaining EPA's need for enforceable standards. Based on comments, EPA is now considering an approach that bases the determination of application rates on the Nutrient Management Standards (NRCS Conservation Practice 590) without mandating the use of one of the three methods described in EPA's proposal. EPA solicits comment on this possible approach.

EPA believes there are regions where crop removal rates of nutrients are unusually low, or where manure is typically stored in a concentrated form such as poultry litter or under house slurry storage. Some application equipment may not be able to evenly distribute this form of manure nutrients at very low application rates. EPA determined this could prevent some facilities from applying manure to land on a phosphorus-based rate. Therefore EPA proposed poultry litter could be applied to fields above the phosphorus rate, but no additional manure or litter could be spread until the phosphorus applied has been removed by harvest. This type of application of phosphorus in excess of the current year's crop requirements is often referred to as ''banking''. Some comments expressed the need for more flexibility in multi-year phosphorus application rates, because of the limitations imposed by current manure application equipment on the ability to apply manure at single-year crop removal rates. Some stakeholders also stated the need to apply commercial fertilizer to fields that receive manure on a phosphorus-based rate would increase soil compaction and reduce crop yields. EPA believes the agricultural industry will continue to develop new modifications for application equipment that, in combination with GIS based monitoring systems, will make precision applications feasible and affordable. EPA also believes the combination of feed management (precision feeding, feed additives), improved animal genetics, and manure handling practices that minimize nitrogen losses will result in land applied manure that more closely meets the needs of the crops.

Nevertheless, EPA is considering alternative nutrient management strategies that balance the nutrient needs of the crop plus the ''banking'' of phosphorus in the soil, if necessary, so the facility can realistically land apply manure on the acreage available, or find alternatives if necessary. For those fields that require manure be applied at a phosphorus-based rate, EPA is considering an approach that would continue to allow manure application up to the nitrogen-based rate. Under this approach, no additional manure application to these same fields could occur until all phosphorus applied has been removed through plant uptake and or crop removal.

The Agency is considering determining that this practice would be acceptable as part of what constitutes ''proper agricultural practices.'' EPA believes such an approach would result in from 2 to 8 years ''phosphorus banking'' for most manure, but more than 10 years ''phosphorus banking'' in the more concentrated manure. EPA envisions commercial fertilizers would continue to be used to meet the nitrogen requirements of the crops in subsequent years. EPA is concerned some levels of phosphorus banking would no more prevent discharges to the waters than would unrestricted application rates or application of manure on a nitrogen basis, especially after prolonged storage. Therefore EPA solicits comment on reasonable amounts of phosphorus banking that could be considered an acceptable nutrient management practice. EPA also solicits comment on whether banking practices should be limited to solids and slurries, or whether banking should be considered for all manure applications. EPA specifically solicits data comparing runoff from fields receiving manure on a phosphorus based rate and runoff from fields where phosphorus has been ''banked.''

4. Alternative Requirements for Soil Sampling

EPA proposed the CAFO must take soil phosphorus samples every three years if the manure is applied to crop or pasture land under the control of the CAFO. EPA proposed samples should be collected in accordance with accepted State agricultural extension protocols and the analyses must be conducted in accordance with the state nutrient standards. Records of the sampling methods and sampling results should be maintained by the CAFO for five years.

EPA has obtained new data indicating local protocols may already consider the site-specific nature of soils. Consequently, EPA is considering allowing relatively less frequent sampling of those soils slow to accumulate nutrients, but requiring multiple soil phosphorus samples each year in mobile soils and high risk areas. EPA solicits comment on the appropriate frequency for soil sampling under such conditions.

After reviewing comments, EPA discussed sampling frequencies and protocols with USDA, and is considering an approach where soil sampling should be done at a frequency as specified by state protocols, but at least once per five years to allow at least one sample to be conducted per field unit per NPDES permit cycle. EPA believes sampling methods and analyses still need to be conducted locally to allow for meaningful information to be gathered from the sampling. EPA also believes the documentation of soil sampling is an important tool for managing phosphorus buildup in soils, but is interested in ways to minimize the recordkeeping burden, especially for small businesses. EPA solicits comment on the approach of allowing States to determine appropriate sampling frequencies and protocols.

5. Alternative Requirements for Manure Sampling

EPA proposed annual minimum sampling frequencies for nitrogen, phosphorus, and potassium in manure (§ 412.37). EPA believes an essential component to sampling is ensuring the manure sampled is ''representative.'' Therefore, under the proposal, such samples were to be collected from all manure storage areas and wastewater storage areas to provide representative samples of each waste stream at the CAFO. Manure transported off site would need to be sampled at least once a year for nitrogen, phosphorus, and potassium. EPA proposed samples must be collected in accordance with accepted Extension protocols, and the analyses must be conducted in accordance with the state nutrient standards. Records of the sampling methods and sampling results would need to be maintained by the CAFO for five years.

Some stakeholders expressed concerns over the burden of annual manure sampling all waste streams, particular if nothing has changed at the farm that would affect the results of manure analysis. For example, after a ''history'' or profile of manure analyses has been documented, these stakeholders assert less frequent analysis may be sufficient as long as production practices remain constant. EPA solicits comment on allowing less frequent manure sampling after such a profile has been established by the CAFO. Similar to the approach described for soil sampling, EPA is considering an approach where manure sampling periodicity can be set to follow state protocols, with a minimal

sampling rate of once per year per waste stream. EPA also believes the documentation of manure sampling is very important, but is interested in ways to minimize the recordkeeping burden, especially for small businesses. EPA solicits comment on the approach of allowing States to determine appropriate sampling frequencies and protocols, and whether EPA should establish a minimum sampling requirement and testing frequency.

6. Feasibility of Zero Discharge Standard

EPA proposed a zero-discharge performance standard for the production area (technology option 5) for the swine, veal, and poultry subcategories without allowance for discharges from chronic or catastrophic storms (see § 412.43). EPA's proposed technology option 5 assumes outside liquid manure storage (lagoons) that do not collect open lot runoff could be designed and maintained to handle precipitation from virtually any storm through the use of liquid-impermeable covers. Some facilities could choose to close out their lagoons and construct smaller covered liquid storage or new slurry storage. As described in the preamble, manure stored under the confinement housing (such as swine deep pits or layers in high-rise houses) could meet the performance standard at generally little or no additional cost. Dry manure systems (most broilers, pullets, and turkeys) where litter is stored under cover (storage sheds or stored in bermed areas with tarps) could also meet the standard.

Some stakeholders felt impermeable lagoon covers in particular posed a number of operational challenges: freezing, biogas collection, clean storm water management, wind shear, cover repair, and disposal of spent covers. For these reasons, these stakeholders concluded the zero discharge standard was technologically unfeasible.

EPA believes the record information on the demonstration status of impermeable lagoon covers, including those in use in other industries, adequately addresses these feasibility concerns. EPA has data from several vendors; one such vendor has developed over a dozen such systems ranging in size from 3 acres to almost 20 acres. Covered lagoon systems have been successfully implemented in colder climates such as northern Illinois, South Dakota, and Wisconsin, and in high rainfall areas such as South Carolina, North Carolina, and Georgia. These systems are routinely exposed to and resist freezing, high winds, and other extreme weather events. Furthermore, the systems are typically retrofit to existing lagoon applications, and EPA believes the technology is further established in the municipal and food processing sectors. To date, EPA has not received any additional information demonstrating cover susceptibility to extreme weather events.

Since proposal, EPA has received additional information on one type of lagoon cover technology used in other industries (food processing, municipal wastewater treatment) that uses a heavy HDPE floating cover. The cover, including additional slack to compensate for changing liquid levels, is anchored in a trench filled with concrete. The cover system also has ballast pipes to keep the cover in place during high winds and peak methane production periods. Current membrane technologies include heavier synthetic materials approaching a 25-year useful life. The systems utilize supports under the cover for buoyancy, and a sump collection system is fabricated into the cover to remove storm water during periods of rain and snow melt. One series of plumbing allows liquid to be pulled from the top of the lagoons under the cover. A second series of piping allows sludge to be periodically removed with a vacuum truck, eliminating the need to move the cover. In addition to eliminating all discharges in dozens of lagoon applications, the technology has demonstrated an ability to reduce air emissions, to mitigate odors, and in some limited cases to provide cost offsets in the form of alternative energy. EPA believes this is useful additional information in indicating the feasibility and availability of this type of technology. The Agency believes this technology would be equally available for use in the animal feeding operations industry. EPA solicits comment on the use of these demonstrated technologies for application in the animal feeding operations industries.

EPA also has extensive experience in the use of impermeable lagoon covers in the AgStar program. While these systems were not designed for the purpose of preventing discharges under any storm event, these systems have routinely demonstrated zero discharge is attainable. Digesters such as heated tanks further incorporate features to contain possible discharges that can occur from pipe penetration points in the tank. Additional experiences of those farms participating in EPA's AgStar program demonstrate gas generation and collection is crucial to the profitability of anaerobic digesters. Despite the potential for energy generation and other cost offsets, EPA does not believe anaerobic digesters are necessarily suitable for all locations and conditions. EPA believes the sizable capital expenditure coupled with today's low energy costs make it difficult for many anaerobic digesters to be cost effective. EPA also noted digesters need to be properly managed, which can pose challenges for smaller facilities because they have fewer resources available to control a digester. Material vendors and digester consultants also point to the gas collection system as a critical component. A properly sized and managed collection system does not experience foaming, freezing, and cover bubbling. The covers are designed to support weights such as workers during routine inspection or repair and maintenance, and as noted the covers are routinely and safely installed as a retrofit. Therefore EPA's costs for the proposed performance standards assume all such biogas is flared to simplify management and time constraints of operating a covered lagoon system.

EPA will continue to evaluate the feasibility of the proposed technology option 5, especially for smaller facilities that are more likely to employ open lot or partially housed confinement practices (see section V.B.2 for additional discussion of EPA's extension of its model farm approach). To reiterate, EPA is not reopening the proposal in general for further comment, however EPA solicits additional comment and information on the identification of impermeable lagoon covers as BAT technologies to meet a zero discharge performance standard. Specifically, EPA solicits additional information on CAFOs (or other facilities with similar liquid impoundments) where impermeable covers are in use, including detailed information describing the system design, construction, cost, and operation. As EPA stated above in this section, some commenters speculate that impermeable covers pose certain operational challenges that would lead to the zero discharge standard being technologically infeasible. To further investigate the commenters' concerns about technological feasibility, EPA also solicits data that would support a determination that the technologies serving as a basis for the proposed BAT and NSPS are infeasible. Examples of such data include detailed information on specific locations where the technologies were attempted but failed, data regarding the design and size of the system employed (both physical

dimensions and wastewater throughput), construction materials and methods employed, and detailed descriptions of the manner in which the technology failed and the reasons for the failure.

V. Changes EPA Is Considering to its Cost and Economic Impact Models

EPA received a number of comments questioning the approach EPA used to assess costs and financial impacts to regulated CAFOs. In general, commenters expressed concern that EPA had underestimated the costs associated with the proposed rule and also overestimated the CAFO's ability to absorb expected compliance costs. In particular, commenters question the accuracy of EPA's estimated average compliance costs associated with the proposed requirements as well as the appropriateness of EPA's financial model to evaluate financial impacts from these expected costs. For these reasons, many comments received by EPA challenge the Agency's proposal that the proposed revisions to the CAFO regulations are ''economically achievable.'' Some commenters provided EPA with alternative data and suggestions on ways that EPA could improve its analyses supporting the rule. Today EPA presents these data and describes modifications to its existing cost and economic models that the Agency is considering in order to address commenter's concerns.

EPA received additional cost and financial data from USDA, FAPRI (Food and Agricultural Policy Research Institute), some industry trade associations, and researchers at some land grant universities. In addition, since proposal, EPA has considered ways to refine its cost and financial models and has received many suggestions on how to modify its modeling approach by these major stakeholder groups. A summary of these additional data and information are summarized in this section.

A summary of the principal concerns about EPA's cost and economic analyses that were raised during the public comment period include: (1) EPA's assumption that CAFOs are already in full compliance with existing Federal and State regulations for operations with more than 1,000 AU, (2) EPA's approach for estimating expected incremental compliance costs that would be incurred by CAFOs, (3) financial data used as inputs to EPA's economic models to depict baseline financial conditions, particularly for certain sectors, (4) EPA's failure to assess the feasibility of an operation to incur new debt associated with additional capital investments required under the proposed requirements, and (5) EPA's suggested criteria and overall analytical approach to evaluate post-regulatory changes and to determine economic achievability.

Following a discussion of the alternate data and information obtained by EPA to update its industry profile of the individual CAFO sectors (Section V.A), this section describes alternative data and information obtained by EPA that the Agency is considering to use to further refine the analytical models that it will use to develop and evaluate the final CAFO regulations. Section V.B describes alternative data and approaches that EPA is considering to address comments about its cost models to estimate compliance costs; Section V.C describes alternative data and approaches that EPA is considering to address comments about its economic model to evaluate financial impacts to regulated CAFOs.

All record materials cited in today's notice are available for public review in the rulemaking record located at EPA's docket office.

A. Industry Profile

1. Estimates of the Total Number of AFOs and Regulated CAFOs

For the proposal, EPA used publicly available data from the *1997 Census of Agriculture,* supplemented by other data sources, to estimate the number of AFOs and potential CAFOs nationwide that would be required to obtain a permit. EPA used this information to assess the costs and evaluate the financial impacts to CAFOs under the proposed regulations. Today EPA is presenting alternative data provided by USDA on total number of AFOs and regulated CAFOs. EPA is soliciting comment on these revised USDA AFO–CAFO estimates for use in EPA's cost and economic impact analyses.

Following proposal, USDA evaluated available information from the *1997 Census of Agriculture* to estimate the number of animal feeding operations at different size thresholds. USDA estimates the number of operations with confined animals by focusing on those operations that meet certain minimum characteristics based on USDA-assumptions in terms of the number of animals and the amount of revenue generated at an operation. This approach does not specifically focus on characteristics that meet the regulatory definition of an animal feeding operation, as codified at 40 CFR 122, in terms of the number of days animals are confined or the amount of vegetative cover at the production area.

For this analysis, USDA assumed that operations that confine animals consist of commercial operations only, excluding: (1) operations with less than $5,000 in annual sales of specialty livestock products, and (2) operations with few animals, defined by USDA as farms with less than 7 animal units of any combination of fattened cattle, milk cows, swine, chickens and turkeys (as well as farms with less than 10 animal units of cattle other than fattened cattle and milk cows, farms with less than 15 horses, ponies, mules, burros, or donkeys, and farms with less than 40 sheep, lambs, or goats). In USDA's analysis, the use of animal units to establish the 7 AU cutoff is based on the USDA definitions of 1,000 pounds of liveweight and not EPA's regulatory definitions which are expressed in terms of the number of animals on-site (codified in 40 CFR 122). However, USDA estimates of the number of confinement operations at different AU thresholds is based on EPA's regulatory definitions.

Table 5–1 reflects revised estimates by USDA on the number of AFOs that confine livestock and poultry and the number of potential CAFOs. These estimates are preliminary and may be subject to further revision by USDA. The table compares these numbers against those used by EPA for the proposed rulemaking. Detailed information on USDA's estimated AFO and CAFO counts are provided in the record (see USDA/NRCS ''Profile of Farms with Livestock in the United States: A Statistical Summary,'' most recent draft available).

As shown in the table, there is a substantial difference between USDA's and EPA's estimates of the total number of AFOs. For the proposal, EPA estimated that there were a total of 376,000 AFOs nationwide in 1997. In contrast, USDA estimates indicate that there are about 218,000 AFOs during that year. One reason for this discrepancy is that EPA used publicly available data from the *1997 Census of Agriculture,* supplemented by other data sources, to estimate the number of AFOs for its proposed rule. In some cases, EPA estimates were extrapolated from available information. Since EPA did not have access to the underlying farm level census data it was unable to fully evaluate the data and exclude certain operations that are likely not AFOs that may be included in EPA's estimates, such as some operations that raise animals for on-farm consumption only as well as grazing or pasture-based operations that are not AFOs. Instead EPA assumed that all operations listed in the published census data, with

limited exceptions, were potential AFOs. As shown in Table 5–1, EPA's estimate of the total number of AFOs greatly exceeds that estimated by USDA across all sectors: EPA estimated more than 420,000 AFOs with fewer than 300 AU; USDA estimates that there are less than 170,000 AFOs with fewer than 300 AU.

Another reason for the difference between EPA and USDA estimates of the total number of AFOs is that USDA excludes certain operations based on the size of the operation (number of animals or annual revenue generated), regardless of whether they would otherwise fall within the regulatory definition of an animal feeding operation, as codified in 40 CFR 122. This information is a regulatory definition and generally not reflected in any available data sets of the number of livestock and poultry operations. Nevertheless, EPA believes USDA estimates that exclude these smaller sized operations provide a reasonable approximation of the total number of animal feeding operations from which to determine the relevant regulated universe because it is unlikely that many of the smaller, non-commercial operations would meet EPA's definition of an AFO. EPA solicits comment on this assumption.

There is less of a difference between USDA's and EPA's estimates of the total number of potentially regulated CAFOs at the varying size thresholds (operations with more than 1,000 AU and, at select increments, operations with fewer than 1,000 AU but with more than 300 AU). However, USDA estimates that there are more than 6,000 additional operations with between 300 AU and 1,000 AU (see Table 5–1 where EPA estimates indicate about 26,500 operations and USDA estimates are about 32,800 operations for that size group). This difference could raise the number of potential CAFOs, depending on how the Agency defines a CAFO. The principal reason for this difference between EPA and USDA estimates is attributable to EPA's use of a simple correction factor to account for the number of operations with more than a single animal type (described further below). Table 5–2 presents data that delineate the number of facilities in each sector by broad size grouping that are expected to be affected by the proposed regulations.

For the purposes of developing and evaluating the final CAFO regulations, EPA is considering using revised estimates provided by USDA. Tables 5–1 through Table 5–3 present preliminary estimates of these data. These estimates are subject to further revision by USDA. More information on these data and how they were developed are included in EPA's record.

Preliminary estimates presented in Table 5–1 would supplement data previously presented by EPA in Table 6–1, also published in the proposal (66 FR 2984). Data presented in Table 5–2 would supplement data previously presented by EPA in Table 6–2, published in the **Federal Register** notice of the proposed rulemaking (66 FR 2985). Where USDA estimates are provided at a higher level of aggregation than that needed by EPA to conduct its analyses, EPA will extrapolate from available USDA estimates. For example, USDA estimates shown in Table 5–2 does not distinguish between the number of operations with chickens that are broiler and egg laying operations, as well as the number of hog operations that are grow-finish and farrow-finish.

Table 5–3 presents preliminary estimates that delineate the number of facilities in each State and each EPA Region that are expected to be affected by the proposed regulations. Data presented in this table replaces data previously presented in Tables 9–1 and 9–2 of the proposal (66 FR 3074–3077). Where USDA estimates are provided at a higher level of aggregation than that needed by EPA to conduct its analyses, EPA will extrapolate from available USDA estimates. For example, USDA data does not distinguish between the number of operations within some individual States, including Alaska, Arizona, Connecticut, Hawaii, Nevada, New Hampshire, New Jersey, New Mexico, North Dakota, Maine, Massachusetts, Montana, Oregon, Rhode Island, Utah, Vermont, and Wyoming (see Table 5–3). These base data would also need to be further distributed out onto a county level basis for use in EPA's analysis of the estimated reduction in nutrient loadings that is expected under the proposed regulations.

EPA's use of these data will affect underlying assumptions of the number of operations reflected in various analyses supporting the CAFO proposal, including EPA's estimate of the number of regulated CAFOs for the purposes of estimating costs and financial impacts to regulated CAFOs and estimating benefits in terms of reduced nutrient loadings, and EPA's estimate of the number of permits required under the proposed regulation to estimate the costs to the State and Federal permitting authority.

EPA is also interested in obtaining preliminary data and information on general trends in the U.S. livestock and poultry sectors in terms of changes in the number of operations since 1997—the last available *Census of Agriculture* year used by USDA to estimate the number of potential CAFOs. EPA is requesting this information to determine whether there has been a substantial increase in the number of larger sized operations since 1997 and to consider whether the Agency should revise available USDA estimates of the number of potential CAFOs. Specifically, EPA requests recent sector level data on the number of operations with more than 1,000 AU and also the number of operations with between 300 AU and 1,000 AU. To ensure uniformity within a sector, these data should be national in scope and reflect trends across all producing States. EPA will consider using these data to update USDA estimates of the number potential CAFOs for some sectors, to the extent that these new data allow.

An advantage of using these alternate data is that the USDA data reflect the number of operations based on dominant production type at the facility and do not need to be corrected to account for ''mixed'' operations that have more than one animal type. For the proposed rulemaking, EPA adjusted the sum total number of operations from the published data to eliminate double counting of operations with mixed animal types. The factors EPA used were based on data from the *1992 Census of Agriculture* indicating that operations with mixed animal types account for roughly 200 operations with more than 1,000 AU and about 25 percent of all operations with less than 1,000 AU. (This latter correction factor is likely more representative of smaller operations; information was not available to better identify the number of operations with mixed animals with between 300 and 1,000 AU.) Use of USDA's revised estimates of the number of operations avoids the need to correct the data using a simple adjustment factor. This will ultimately contribute to more accurate cost analyses by minimizing the chance of error associated with deriving an estimate of the number of potential CAFOs that require a permit.

Under the USDA–EPA Unified National Strategy for Animal Feeding Operations, EPA predicted that approximately 20,000 animal feeding operations would be subject to regulation, estimated at that time to comprise roughly 5 percent of the estimated 450,000 AFOs. Estimates of the number of AFOs reported in the Strategy were based on the published data from the *1992 Census of Agriculture* and so include smaller, non-commercial operations. The data presented here provide updated

estimates of the AFO base population and have been substantially revised to eliminate smaller, non-commercial operations. However, EPA's expected *number* of potentially regulated CAFOs remains unchanged and consistent with the goals of the Strategy—estimated at about 20,000 regulated entities or CAFOs.

TABLE 5–1.—COMPARISON OF ESTIMATES BY EPA AND USDA OF THE NUMBER OF AFOS BY SIZE GROUP

Sector/size category	EPA estimates at proposal				USDA's revised estimates			
	All AFOs	>1000 AU	300–1000 AU	<300 AU	All AFOs	>1000 AU	300–1000 AU	<300 AU
	(Number of operations grouped by AU [1])							
Cattle	106,080	2,080	2,000	102,000	43,560	1,970	3,130	38,460
Veal	850	10	200	640		30	90	
					4,250			3,550
Heifers	1,250	300	750	200		310	270	
Dairy	116,870	1,450	5,680	109,740	92,610	1,470	5,670	85,480
Hogs	117,880	4,090	10,280	103,510	48,180	4,080	10,150	33,950
Broilers	34,860	3,940	10,200	20,720	17,740			
						3,720	12,380	8,020
Layers	75,170	640	1,410	73,120	6,380			
Turkeys	13,720	370	1,330	12,020	3,290	450	1,600	1,240
Sum Total	466,680	12,880	31,850	421,950	216,010	12,020	33,290	170,700
Total AFOs [2]	375,700	12,660	26,450	336,590	218,320	11,380	32,820	NA

[1] As defined for the proposed CAFO regulations, one AU is equivalent to: One slaughter or feeder cattle, calf or heifer; 0.7 mature dairy cattle; 2.5 hogs (over 55 pounds) or 5 nursery pigs; 55 turkeys; and 100 chickens regardless of the animal waste system used.

[2] For EPA data, ''Total'' eliminates double counting of operations with mixed animal types based on *1992 Census of Agriculture* data (operations with mixed animal types account for roughly 25 percent of total AFOs). USDA data reflect number of operations based on dominant production type. The difference between the sum total and total AFOs is about 2,000 operations (reflect operations that are difficult to classify including dairies that have gone out of business, farms with only feeder pigs, and egg-hatching operations).

Source: EPA estimates, see proposed CAFO regulations (Section 6 of 66 FR 2959). USDA estimates, see NRCS ''Profile of Farms with Livestock in the United States: A Statistical Summary'' most recent draft available. Rounded to nearest tenth.

TABLE 5–2.—ESTIMATED NUMBER OF CAFOS BY SECTOR AND SIZE

Sector	Potential CAFOs >1,000 AU	Potential CAFOs 750–1,000 AU	Potential CAFOs 500–750 AU	Potential CAFOs 300–500 AU
	(Number of Operations grouped by AU)			
Cattle	1,970	500	940	1,690
Heifers	310	40	90	150
Veal	30	10	20	60
Dairy	1,470	600	1,360	3,710
Hogs	4,080	1,570	2,920	5,670
Chickens	3,720	2,660	4,440	5,280
Turkeys	450	260	470	870
Sum over all	12,020	5,630	10,240	17,420
Adjustment	640	140	180	150
Total CAFOs	11,380	5,490	10,060	17,280

Source: USDA/NRCS (''Profile of Farms with Livestock in the United States: A Statistical Summary'' most recent draft available). Rounded to nearest tenth. AU groupings defined in Table 5–1.

TABLE 5–3.—ESTIMATED NUMBER OF POTENTIAL CAFOS BY REGION, STATE AND SIZE [1]

State/EPA region	Potential CAFOs >1000 AU	Potential CAFOs >750 AU	Potential CAFOs >500 AU	Potential CAFOs >300 AU
	(Number of Operations grouped by AU)			
Alabama	410	760	1,390	2,200
Arkansas	510	920	1,730	2,970
California	950	1,240	1,660	2,150
Colorado	190	230	300	410
Delaware	70	140	310	580
Florida	140	220	330	450
Georgia	660	1,060	1,640	2,350
Idaho	140	170	240	380
Illinois	360	550	910	1,680

TABLE 5–3.—ESTIMATED NUMBER OF POTENTIAL CAFOS BY REGION, STATE AND SIZE [1]—Continued

State/EPA region	Potential CAFOs >1000 AU	Potential CAFOs >750 AU	Potential CAFOs >500 AU	Potential CAFOs >300 AU
Indiana	370	520	830	1,450
Iowa	1,080	1,670	2,900	5,300
Kansas	350	420	570	840
Kentucky	110	160	270	440
Louisiana	70	150	250	350
Maryland	90	200	430	740
Michigan	170	230	340	670
Minnesota	590	850	1,370	2,380
Mississippi	340	630	990	1,290
Missouri	290	430	660	1,270
N. Carolina	1,310	1,760	2,450	3,470
Nebraska	700	860	1,220	1,960
New York	70	120	250	650
Ohio	180	280	450	930
Oklahoma	130	220	420	700
Pennsylvania	240	380	680	1,250
S. Carolina	180	280	400	570
South Dakota	190	250	360	630
Tennessee	60	110	230	490
Texas	610	790	1,170	1,680
Virginia	160	310	560	940
Washington	140	190	290	500
West Virginia	60	90	150	200
Wisconsin	100	160	380	960
UT, MT, WY, ND, NV	140	190	290	540
OR, AK, HI	50	80	140	250
AZ, NM	190	220	260	280
ME, VT, NH, MA, RI, CT, and NJ	30	60	120	300
All states	11,380	16,870	26,920	44,200

Source: USDA/NRCS (''Profile of Farms with Livestock in the United States: A Statistical Summary'' most recent draft available). Rounded to nearest tenth. AU groupings defined in Table 5–1.

2. Estimates of the Amount of Manure Nutrients Covered at Different Regulatory Thresholds

For the proposal, EPA estimated the amount of manure nutrients covered under the different regulatory scenarios. These estimates were based on publicly available data from the *1997 Census of Agriculture* supplemented by other data sources. EPA used this information, among other factors, to determine the proposed regulatory thresholds based on the number of animals on-site (inventory basis). As cited in the Agency's proposal, EPA estimated that about 50 percent to 64 percent of manure nutrients *generated* (nitrogen and phosphorous) would be addressed by the proposed regulations at the 1,000 AU threshold and proposed 500 AU threshold, respectively. Today EPA presents new information on the manure nutrient coverage under the different regulatory scenarios based on a supplemental analysis conducted by USDA. EPA is soliciting comment on this analysis for consideration in the final rulemaking.

In its analysis that re-estimates the number of AFOs and CAFOs nationwide using data from the *1997 Census of Agriculture* (presented in Section V.A.1 of this notice), USDA also conducted an analysis of the expected amount of manure nutrients addressed at each regulatory threshold. These results are presented in this notice both in terms of the amount of manure nutrients *generated* at potential CAFOs and also the estimated amount of nutrients in *excess* of crop needs through land application. (USDA defines farm level ''excess'' of manure nutrients on a confined livestock farm as manure nutrient production less crop assimilative capacity. USDA has estimated manure nutrient production using the number of animals by species, standard manure production per animal unit, and nutrient composition of each type of manure. Recoverable manure is the amount that can be collected and disposed by spreading on fields or transporting off the producing farm.)

Table 5–4 presents USDA's estimates of the amount of manure nutrients addressed by the proposed regulations and compared against the expected number of potential permits that would be required at different threshold levels. USDA submitted these data to EPA for consideration in establishing its regulatory threshold for defining a CAFO as part of the Agency's final rulemaking. The information presented today would replace and supplement previous estimates by EPA, which was presented in Table 6–3 of in the **Federal Register** notice of the proposed rule (66 FR 2986–2987). USDA estimates of the amount of coverage of manure nutrients generated are more or less consistent with EPA's estimates for the proposed regulations. (See 66 FR 2986–2987.) For proposal, EPA was not able to estimate the amount of excess manure nutrients because of data limitations.

USDA's analysis supplements EPA estimates by assessing the amount of excess manure nutrients addressed by the regulations using *1997 Census of Agriculture* data. This analysis is available at USDA's website at: http://www.ers.usda.gov/briefing/ConservationAndEnvironment/. Information on USDA's approach for conducting this analysis is documented in two published USDA reports, including ''Manure Nutrients Relative to the Capacity of Cropland and Pastureland to Assimilate Nutrients: Spatial and Temporal Trends for the United States'' available at http://www.nhq.nrcs.usda.gov/land/pubs/manntr.html and also ''Confined Animal

Production and Manure Nutrients'' available at http://www.ers.usda.gov/publications/aib771/. These documents are also available in EPA's record for the proposed rule.

Some commenters endorse USDA's analysis and cite these results to highlight the perceived lower environmental gain relative to the increase in the number of operations affected as the regulatory threshold is lowered. EPA will consider this information when re-evaluating the range of proposed CAFO threshold definitions for the final CAFO regulations. EPA solicits comment on the use of these USDA estimates for the development of EPA's final regulations.

TABLE 5–4.—POTENTIAL CAFOS, ANIMAL UNITS, AND MANURE NUTRIENTS, 1997 CENSUS OF AGRICULTURE

Item	Units	Total for Item	AFOs defined as CAFOs, by threshold			
			1000AU	750AU	500AU	300AU
	Percent of Total					
Farms/AFOs	number	218,000	5.4	8.0	12.8	21.1
Animal Units	million	36.3	51.8	56.9	64.0	72.9
Recoverable Nutrients:						
Nitrogen	1000 tons	1,260	48.6	56.3	66.3	76.6
Phosphorus	1000 tons	689	52.2	59.4	68.8	78.9
Excess Nutrients:						
Nitrogen	1000 tons	743	64.4	73.4	84.1	92.8
Phosphorus	1000 tons	467	67.3	75.1	84.5	92.7

Source: USDA. Includes operations with feedlot beef, dairy (including confined heifer and veal), swine, and poultry (including layers, broilers, pullets, and turkeys). For AU definitions, see Table 5–1

3. Changes in SBA's Small Business Definition and EPA's Estimates of the Total Number of Small Businesses Affected by the Proposed Regulations

For the proposal, EPA estimated the number of small businesses that are CAFOs that would be subject to the proposed regulations. Today EPA presents revised estimates of the number of affected small business using new small business definitions as revised by the Small Business Administration (SBA) in June, 2001. EPA is soliciting comment on these estimates for consideration in the final rulemaking.

The Regulatory Flexibility Act (RFA), as amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA), generally requires EPA to define small businesses according to size standards as defined by the Small Business Administration (SBA). For these regulated industries, SBA sets size standards for defining small businesses by the amount of annual revenue generated, representing total facility revenue at the farm level (i.e., includes revenue from all sources, including livestock, crop and other farm-related income at a livestock or poultry operation) and expressed as an average over a 3-year period. These size standards vary by North American Industry Classification System (NAICS) code; CAFOs are listed under NAICS 11 (Agriculture, Forestry, and Fishing).

Prior to 2001, SBA defined a ''small business'' for most agriculture enterprises as operations with annual sales of less than $0.5 million per year, averaged over the most recent three fiscal years. For the proposed rulemaking, SBA standards used by EPA to define a ''small business'' in the hog, dairy, broiler, and turkey sectors assumed a threshold of less than $0.5 million in annual sales. In the beef feedlot sector, SBA defines small businesses as those with less than $1.5 million in annual sales. EPA assumed an alternative definition for small businesses in the egg laying sector of operations with less than $1.5 million in annual revenue and did not use SBA's definition of $9 million in annual sales. The rationale for this decision is discussed in detail in EPA's record and in the Economic Analysis that supports this rulemaking. A summary of EPA's rationale for using an alternative definition is provided in the **Federal Register** notice of the proposed rulemaking (66 FR 3099).

On June 7, 2001, SBA increased the size standards used to define small businesses for most agriculture sectors listed under NAICS 11. These size standards were raised from $0.5 million to $0.75 million in average annual receipts (see 66 FR 30646). This change affects EPA's assumptions of small business in the hog, dairy, broiler, and turkey sectors and effectively raises EPA's estimate of the number of small businesses that are animal feeding operations and are potentially defined as CAFOs and subject to the proposed requirements. (This change does not affect EPA's assumptions of small business in the beef feedlot and egg laying sectors.)

For the proposed regulations, EPA estimated that 11,000 to 15,000 confinement operations that will be subject to the proposed requirements are small businesses (depending on the proposed regulatory alternative). As a result of this change in SBA's small business definition, preliminary estimates by EPA now indicate that roughly 19,000 to 25,000 of the affected operations are small businesses. Although these estimates may be subject to further revision, data presented in Table 5–5 would replace information previously presented by EPA in Table 10–17 of the **Federal Register** notice of the proposed rulemaking (66 FR 3100). EPA solicits comment on these preliminary estimates of the number of small businesses affected by the proposed regulations.

TABLE 5–5.—NUMBER OF SMALL CAFOS THAT MAY BE AFFECTED BY THE PROPOSED REGULATIONS

Sector	Total Annual ($million) Revenue [1] (a)		Total Farm Revenue per Head [2] (b)	No. of Animals (Avg. U.S.) (c=a/b)		Number of ''Small'' CAFOs Affected by Proposed Regulations	
	Old	New		Old	New	Old	New
Cattle [3]	$1.5	NC	$1,060	1,400	NC	2,280–2,600	NC
Dairy	0.5	$0.75	2,573	200	300	50	1,000–2,000
Hogs	0.5	0.75	363	1,400	2,100	300	4,000–5,000
Broilers	0.5	0.75	2	260,000	375,000	9,470–13,410	10,000–14,000
Egg Layers	9.0	NC	25	365,000	ND	ND	ND
	1.5	NC		61,000	NC	200–590	NC
Turkeys	0.5	0.75	20	25,000	37,500	0	500–1,000
All AFOs	NA	NA	NA	NA	NA	10,550–14,360	19,000–25,000

NA=Not Applicable. ND = Not Determined. NC = No Change from original proposal. ''AFOs'' have confined animals on-site. ''Old'' refers to SBA size definitions prior to June, 2001. ''New'' refers to revised SBA size definitions published on June 7, 2001.

[1] SBA Size Standards by NAICS industry (13 CFR Part 121). EPA assumes an alternative definition of $1.5 million in annual revenues for egg layers.

[2] Average total farm revenue (i.e., including livestock, crop and other farm-related income at a livestock or poultry operation) expressed on a per animal basis across all operations for each sector. Per-animal (inventory) calculations as derived by EPA using aggregated farm level data from USDA's 1997 ARMS database.

[3] Includes fed cattle, veal and heifers.

B. Data and Analytical Approach to Estimate Compliance Costs to CAFOs

This section describes alternative data and approaches that EPA is considering to address commenters' concerns about the methodology to estimate compliance costs.

1. Alternate Analytical Approaches for Estimating Compliance Costs

This section describes alternative approaches that EPA is considering to address concerns about the methodology used to estimate compliance costs.

a. EPA's Assumptions of Full Compliance With Existing Regulations for CAFOs With More Than 1,000 AU

In the proposal, EPA assumed that all operations with more than 1,000 AU that are defined as CAFOs by the existing regulations are currently in compliance with the existing regulatory program. This includes the NPDES regulations and the effluent limitations guidelines and standards for feedlots, and existing State laws and regulations. For those operations with less than 1,000 AU, EPA used available data regarding current waste treatment practices at these operations to estimate the incremental cost they would incur to comply with the requirements of the proposed regulations.

A number of commenters disagree with this approach, claiming that many CAFOs do not have the necessary waste management components in place to comply with the existing CAFO regulations promulgated in the early 1970s. Despite the fact that the existing regulations were issued over 25 years ago, these commenters claim that many operations with more than 1,000 AU are not currently in compliance with these baseline requirements and would therefore incur substantial costs just to meet the 1970s requirements, in addition to any additional costs that would be incurred to comply with the new requirements of the proposed rule. The commenters thus assert that EPA's failure to acknowledge this widespread noncompliance has the effect of underestimating the full costs that CAFOs will ultimately pay. The commenters further assert that by underestimating costs in this manner, EPA understates the financial impacts to CAFOs.

It is EPA's longstanding practice to assume compliance with current regulatory requirements when revising existing regulations. This assumption is consistent with EPA's guidance for conducting regulatory analysis, outlined in EPA's ''Guidelines for Preparing Economic Analyses.'' EPA's guidance is available online at http://www.epa.gov/economics/. In accordance with EPA practice and guidance, EPA assumes that operations with more than 1,000 AU are in compliance with existing requirements promulgated in the 1970s; these operations are assumed to have already incurred whatever costs were necessary to achieve compliance with these existing requirements. Guidance from the Office of Management and Budget (OMB), as outlined in ''Economic Analysis of Federal Regulations Under Executive Order 12866,'' recommends that the baseline for assessing the costs and benefits of a regulation be, ''* * * the best assessment of the way the world would look absent the proposed regulation.'' OMB's guidance goes on to discuss various factors that may be considered in choosing an appropriate baseline, including existing regulations and the likely degree of compliance with these regulations, and recommends that, ''when more than one baseline appears reasonable or the baseline is very uncertain, and when the estimated benefits and costs of proposed rules are likely to vary significantly with the baseline selected, the agency may choose to measure benefits and costs against multiple alternative baselines as a form of sensitivity analysis.'' OMB's guidance is available online at http://www.whitehouse.gov/omb/inforeg/riaguide.html.

Because of the possibility that there may be widespread noncompliance with the existing regulations and because the potential costs associated with the existing regulations might be substantial, particularly when added to EPA's estimated incremental cost associated with the proposed revisions, EPA is considering ways to evaluate these additional potential costs as a supplement to its cost and economic analyses.

To evaluate the cost of the existing regulations, EPA is requesting additional data and information on current rates of non-compliance. Specifically, information is needed on the number or share of operations with more than 1,000 AU that are not in compliance with the existing regulations. During the development of the proposed CAFO rulemaking, EPA requested additional data and information to substantiate industry claims of widespread non-compliance with the existing regulations. As part of

today's notice, EPA is again requesting any information on current rates of non-compliance with the existing regulation, differentiated to the extent possible by production type or facility size for each of the major livestock and poultry sectors. This information would need to account for animal waste management systems and practices that are already being implemented at the CAFO to manage manure and wastewater, including practices associated with various voluntary programs as well as practices to assist with basic day-to-day production needs at the facility.

EPA is considering to use this information to conduct an evaluation of the combined additional cost to comply with the existing regulations plus the incremental costs of the proposed regulations. EPA is soliciting comment on an approach that would be conducted in two stages, which is outlined as follows. The first stage of this analysis would assess the cost to CAFOs to comply with current requirements—specified for the production area—promulgated under the existing 1970s regulations and further evaluate the expected financial impacts of these costs. Using a representative farm approach, where the Agency determines that compliance with the existing regulations would have resulted in financial stress and potential closure of a representative facility, this operation would be removed from the analysis under the assumptions that this operation would not have remained in business. This representative facility would now constitute a baseline closure for purposes of evaluating the proposed revisions to the existing rule. This approach by which baseline closures are removed from any subsequent analyses is consistent with longstanding Agency practice to assess only the incremental costs associated with a specific regulatory action.

The second stage of this analysis would evaluate costs and financial impacts to comply with the proposed new requirements. These costs and impacts would be assessed for operations within the assumed remaining CAFO universe based on the number of operations assumed to have remained in business while complying with the existing regulations (i.e., excluding assumed baseline closures determined to close under the existing regulations in the first stage of this analysis). EPA solicits comment on this approach and requests data and information in order to conduct this supplemental analysis.

b. EPA's Cost Model Assumptions and Use of ''Frequency Factors''

For the proposal, EPA estimated compliance costs for a model CAFO facility by first estimating the total cost to an individual facility to employ a given technology and then calculating the average facility level cost by adjusting this total cost to account for current use of the technology or management practice nationwide. Average costs were obtained by multiplying the total cost of a particular technology or practice by the percent of operations that are believed to use this particular technology or practice in order to derive the average expected cost that could be incurred by a model CAFO. EPA refers to this adjustment factor as the ''frequency factor'' and has developed such a factor for each individual cost (i.e. each technology) and cost component (i.e. capital and annual costs) in each of its CAFO models. More detailed information on the methodology used by EPA to estimate compliance costs and the actual frequency factors assumed by EPA for this analysis are provided in the *Development Document for the Proposed Revisions to the National Pollutant Discharge Elimination System Regulation and the Effluent Guidelines for Concentrated Animal Feeding Operations* (referred to as the ''Development Document'').

Comments about EPA's cost and economic analysis express concerns about EPA's use of frequency factors to generate a set of single average compliance costs to further evaluate financial impacts to CAFOs as well as to assess larger-scale market impacts. The overarching concern with EPA's use of this approach is that the weighted average costs might either understate costs or overstate costs, depending on the range of production practices at a facility. Use of these estimated costs to assess financial impacts might, therefore, either understate or overstate economic impacts to CAFOs in EPA's analysis. To address this concern, EPA is considering alternative ways to characterize the variability of costs that may be incurred by increasing the number of representative models EPA uses to assess compliance costs.

Today EPA presents data and information on an alternative approach that would refine its existing cost models to account for greater variability among producers by calculating costs across a broader range of potential scenarios, including costs to operations that have implemented a wider array of technology controls and management practices and also costs to operations that have little or no management practices in place. This alternative approach would generate three sets of compliance costs per representative model CAFO, instead of a single average cost per representative model. EPA attempted to develop such a approach for its proposal, but was unable to obtain the data necessary to support this approach.

This notice presents the availability of new data and information that would allow EPA to adopt such an approach, including data received from USDA. This approach would build upon an approach that is being developed by USDA to assess costs and economic impacts at livestock facilities as part of USDA's Report to Congress on the USDA–EPA Unified Strategy that seeks to estimate the costs to animal feeding operation to implement Comprehensive Nutrient Management Plans (CNMP) (forthcoming: ''Cost and Capability Assessment of the Unified Strategy for Animal Feeding Operations''). Details on the approach that is being developed to support this forthcoming study is provided in USDA's ongoing work in progress titled ''Estimated Private and Public Costs Associated with Comprehensive Nutrient Management Plan Implementation: A Documentation.'' Preliminary versions of this latter report are provided in EPA's rulemaking record.

In these reports, USDA outlines an approach that, first, defines a set of representative CAFOs that represent typical or dominant production practices; second, identifies the expected compliance costs associated with the proposed CAFO rule requirements; and, third, adjusts these costs according to how many CAFOs are expected to need upgrades to their facility or practices to meet requirements. This approach is consistent with that used by EPA for the proposal. The difference is the third step in USDA's analysis further breaks out these costs into three categories of farms based on the ''average'' operation and also operations with ''least needs'' and ''most needs.'' USDA's simplifying assumption for this approach is that 50 percent of all operations within each representative farm group represents the average while each representative group representing operations outside the average accounts for 25 percent each of all operations.

For USDA's analysis, it compiled data representing the percent of facilities needing upgrades to meet CNMP requirements. For example, a value of 80 percent indicates that 20 percent of the operations in that category meet the requirements and 80 percent of the

operations need to install or adopt the required controls or practices. USDA's estimates reflect five broad cost components: manure and wastewater handling and storage, nutrient management, record keeping, feed management, and off-farm export. These estimates are contained in USDA's Appendix to its ongoing work in progress (see, ''Estimated Private and Public Costs Associated with Comprehensive Nutrient Management Plan Implementation'').

For EPA's analysis, the Agency is considering using USDA's data and approach, with some modifications to supplement USDA's information and approach where necessary to fit within EPA's existing analytical framework. These additional cost scenarios include costs to operations that have implemented a wider array of technology controls and management practices, as well as costs to operations that have little or no management practices in place. To do this, EPA is considering breaking out its estimated average compliance costs across three different performance group scenarios: below average performers, average performers, and above average performers. For the purpose of this analysis, average performers would represent 50 percent of all operations that employ an average mix of waste management practices and technology controls. These costs would be roughly equivalent to the average costs assumed by EPA for the proposal, with some refinements to incorporate new data and information as necessary. Costs incurred by operations assumed to be above (below) this average would reflect 25 percent of all operations with a higher (lower) mix of practices and controls in place. Stated differently, operations with little or no environmental controls on-site to manage manure would be considered a below average performer, whereas operations that already have substantial manure management practices and controls in place would be considered to perform above average.

Table 5–6 presents an example of this proposed approach for an operation that compares the approach used by EPA for proposal and the alternative approach that EPA is considering using for its analysis to support the final regulations. As shown with this simple example, EPA would develop revised compliance cost estimates arrayed onto three different cost categories for each representative CAFO model, resulting in greater refinement of its estimated costs. These three sets of costs would each be used to assess financial impacts to CAFOs, instead of the single weighted-average cost used by EPA to assess impacts for the proposal. As discussed previously, for proposal, EPA developed its own estimates of the average percent of operations needing upgrade to adjust estimated total costs assumed across all operations. For the analysis supporting the final analysis, EPA is considering using estimates of the average percent of operations needing upgrade across three groups of operations—operations categorized as ''average needs,'' ''least needs,'' and ''most needs'' operations. Financial impacts would therefore be measured against these three sets of average costs per representative model facility, rather than a single average cost. Preliminary estimates that USDA has developed depicting the percent of operations needing upgrade across these three groups of operations that EPA is considering to use for the final analysis are provided in the EPA's record.

TABLE 5–6.—EXAMPLE OF ALTERNATIVE APPROACH TO EPA'S MODEL FARMS BEING CONSIDERED FOR THE FINAL RULE

Cost component	Approach used for proposal		Alternative approach considered		
	Frequency factor	Avg. weighted cost	Least needs (25%) Average	Average (50%)	Most needs (25%)
Cost component #1 ..... Cost Component #2 Cost Component #	Average percent of operations needing upgrade (each cost component).	Average cost across all operations (each cost component).	Average percent of ''least needs'' operations needing upgrade (each cost component).	Average percent of ''average needs'' operations needing upgrade (each cost component).	Average percent of ''most needs'' operations needing upgrade (each cost component)
Total Costs	.....	Average Costs all operations (per Model CAFO).	Average Costs ''least needs'' operations (per Model CAFO).	Average Costs ''average needs'' operations (per Model CAFO).	Average Costs ''most needs'' operations (per Model CAFO)

In order to adopt this approach EPA needs additional information on the adoption and use of various types of management practices and technology controls employed at different types of livestock and poultry operations. In part, USDA is in the process of compiling such estimates that EPA will consider using for the purpose of refining its compliance cost models. These data are based on existing published data and USDA surveys conducted by the Animal and Plant Health Information Service (APHIS) and other State level or industry supplied data and information. This data set covers each of the key sectors (including: Fattened cattle, dairies, confined heifers and veal, swine, broilers, layers, chicken pullets, and turkeys) differentiated by select production regions, facility size, and dominant production type. Additional information on these data and USDA's supporting documentation on how these data were obtained are available for public review in the rulemaking record located at EPA's docket office. The record also contains various supplemental information collected by EPA using this general modeling framework. EPA solicits comment on these data and the alternative approach described here to refine EPA's compliance cost models.

c. Engineering Cost Test To Determine Appropriate Technology Systems

EPA's engineering costs models incorporated an engineering cost test to determine the least expensive combination of technologies that could be used to meet EPA's proposed performance standards. EPA used this cost test to compare the costs of various technology trains that could be used to meet a specific performance standard (a technology train is the combination of linked technologies or BMPs that could be used as part of a manure management system). For example, the engineering cost test was used to compare the overall system cost of various land application methods, nutrient management strategies, capital expenses

for improvements at the production area, and other technologies (see the Development Document).

The engineering costs test was performed by addition of the start-up costs, the fixed costs, and the annual costs, plus a percentage of the capital expenditures to determine the total costs incurred in year one. The percent of capital costs included in this equation depended on the interest rate, period of payback, and down payment consistent with those criteria used in the economic analysis. EPA used 14 percent of the capital expenses to reflect a 10-year depreciation at 7 percent interest (see Economic Analysis). Table 5–7 provides an example of the engineering cost test used for proposal.

TABLE 5–7.—EXAMPLE OF EPA'S ENGINEERING COST TEST USED FOR PROPOSAL

Cost component	Technology train A		
	Technology A	BMP A	Total for technology train A
(1) Start-up Costs	$200	$10	$210
(2) Other Fixed Costs	300	50	350
(3) Annual Costs (O&M)	40	400	440
(4) Capital Costs	5,000	0	-
(5) 14 Percent of Capital Costs	700	0	700
Total Cost for Technology Train A Incurred in Year (1+2+3+5)			$1,700

EPA is considering alternative payback terms and lending arrangements, as discussed in Section V.C. EPA intends to modify the engineering cost test to be consistent with the alternative loan terms under consideration in this notice. For example, if the economic analysis methodology assumes 30 percent of capital would be incurred in year one as a result of down payments, closing costs, and other fees, for consistency the engineering costs test would add 30 percent of the capital to the total start-up costs, fixed costs, and recurring costs in the engineering costs test. Table 5–8 provides an example of the modified engineering cost test applied to the same technology train presented in Table 5–7.

TABLE 5–8.—EXAMPLE OF EPA'S MODIFIED ENGINEERING COST TEST

Cost component	Technology Train A		
	Technology A	BMP A	Total for Technology Train A
(1) Start-up Costs	$200	$10	$210
(2) Other Fixed Costs	300	50	350
(3) Annual Costs (O&M)	40	400	440
(4) Capital Costs	5,000	0	-
(5) 30 Percent of Capital Costs	1,500	0	1,500
(6) Remaining Capital Costs (4–5)	3,500	0	-
(7) 14 Percent of Remaining Capital Costs	490	0	490
Total Cost for Technology Train A Incurred in Year (1+2+3+5+7)			$2,990

The cost incurred for development and implementation of technology train A in the first year is $1,700 using EPA's engineering cost test used for proposal. The total cost for Technology Train A incurred in year 1 would be $2,990 using EPA's modified cost test. EPA solicits comment on the use of the engineering cost test, and the changes to the cost test under consideration.

d. Changes to Costs for Land Application of Lagoon Liquids for Beef and Dairy Operations

The purchase of new or additional land application equipment is often a primary contributor to the overall costs in the beef and dairy cost models. EPA's cost model estimates the costs to purchase irrigation equipment to apply liquid from ponds and lagoons to the crop fields; the model assumed facilities already had access to equipment for solid manure applications. The poultry models assumed dry manure/litter equipment was already available. The swine models considered certain cases where new or different application equipment would be needed, especially under technology option 5 which could change the composition of land applied manures. EPA selected center pivot irrigation for costing land application of liquids from runoff ponds. EPA is considering three additional areas pertaining to the costs for land application; alternative irrigation and land application equipment; additional sludge removal; and limits to land application based on hydraulic loadings (hydraulic loading is used to measure how much water can be applied before the ground approaches saturation and pooling on the surface occurs).

For proposal, EPA costed facilities to spread manure over all acres owned or rented. EPA costed many of these facilities for new or additional land application and irrigation equipment to land apply liquid manure. EPA calculated these costs of irrigation equipment based on all acres owned, even when the facility owned more acres than was needed to utilize all manure as a fertilizer based on nitrogen or phosphorus rates, as appropriate. EPA believes as a practical matter, facilities will irrigate closest fields first, saving solids hauling for the fields farther away from the liquid storage areas. EPA is considering adjusting the model farms to reflect this practice,

which would reduce a facility's overall compliance costs.

For proposal, EPA assumed excess nutrients (excess nutrients are those nutrients beyond the farm's total annual crop requirements) would be hauled off site each year. In the case of liquid storage, EPA costed solids separation for facilities with a large nutrient excess. For other facilities with minimal nutrient excess, EPA costed hauling of liquid assuming the lagoon was mixed prior to pumping. EPA is evaluating an approach where excess nutrients, particularly the excess phosphorus that tends to settle on the bottom of the liquid storage area, would be assumed to accumulate for a period of approximately 3 years. The top liquid fraction would continue to be land applied locally each season, but without mixing of the bottom sludge. The bottom sludge would be removed every three years to maintain capacity of the lagoon, but also to facilitate hauling of a more concentrated slurry. EPA believes this will reduce the volume to be hauled, the number of trips needed, and therefore reduce costs. EPA data suggests facilities are not likely to haul liquid manures more than one mile. EPA believes one mile is approximately the distance the manure can be hauled based on the nutrient value of the manure as compared to the costs of hauling. EPA believes these facilities are more likely to haul a concentrated slurry longer distances and still maintain a net positive value for the transported nutrients.

EPA acknowledged in the proposal that in some cases factors other than nutrients could limit the application rates of manure to crop land. EPA is evaluating those areas where the water holding capacity of the soil could result in a manure application rate more limiting than the phosphorus based rate. For these areas, EPA intends to perform a sensitivity analysis of application rates that considers the hydraulic loading limitations of the crop land. EPA believes facilities currently applying manure on a nitrogen based rate and that need to go to a phosphorus based rate will be mostly unaffected by hydraulic limitations. EPA solicits comments and information on the extent to which hydraulic loading limitations may affect the costs of applying manure.

EPA also assumed that all manures would be distributed evenly on all land available to the animal feeding operation. EPA is considering revisions to the cost estimates for hauling manure to the closest fields first, particularly under a scenario that would allow phosphorus banking. Under such a scenario, additional commercial nitrogen fertilizer would not be needed the year the manure was ''banked''. EPA solicits comments on these modeling assumptions, as well as the baseline model changes under consideration.

e. Cost Offsets and Savings

For proposal, EPA's incremental costs of compliance were potentially overstated because EPA did not include all cost offsets and savings associated with animal production. For example, in the proposal EPA acknowledged some facilities give away manure, and some must pay for the transport of excess manure. To the extent EPA's proposal would require additional transport, EPA has included this expense in its cost models. EPA also accounted for the costs of commercial fertilizer when facilities apply manure on a phosphorus basis, but did not account for the nutrient value of the manure. In EPA's cost reports, EPA estimated an incremental value of $1.70 per ton of for composted manure for Option 5 for beef and dairy. This nutrient value is equal to the difference between the nutrient value of manure versus the nutrient value of compost. EPA is considering an approach that places a nutrient value on manure when it is used on the farm as a resource, especially as a fertilizer replacement. EPA also intends to consider the 1997 (EPA's baseline year) Commercial Fertilizer Institute values of nitrogen and phosphorus for purposes of estimating the nutrient value of manure. EPA solicits comment on the value of the nutrients in manure when used as a fertilizer replacement.

EPA has further estimated that sales of dry poultry litter could offset the costs of meeting the regulatory requirements on the order of more than 50 percent. Some stakeholders have confirmed manure sales, in some cases, can exceed the value of livestock sales. U.S. Poultry conducted a producer survey, the results of which indicate that the producer directly sells 34 percent of litter, and an additional 17 percent is ''traded out'' with a broker, normally for fresh bedding material. EPA analysis and data further indicate concentration of manure nutrients through changes in the moisture and form of the manure allow longer economical hauling distances, particularly with the current increases in fuel prices and increasing costs of diesel-based commercial fertilizers. Similarly wetter manures have increased value after composting or treatment, on the order of $17 per ton for composted dairy and steer manure.

EPA believes its current approach to account for the cost of hauling excess manure off-site is further overstated, as EPA did not consider alternative uses and destinations of manure in its cost analysis. For example, EPA has documented an increasing trend in centralized manure treatment and value-added processing, as well as increased integrator involvement in manure marketing. Poultry litter in particular is considered more valuable than most other animal manures due to its low moisture content and relatively high nutrient value. EPA conservatively estimates litter sales generates an average of $8 per ton. In some circumstances, wetter manures, such as layer manures, are successfully transported and sold at a profit. Market opportunities are further increased by providing a value added or composted product, or by offering custom application services. Bagged compost can be bought at local garden centers for $4 per 40 pound bag, or $200 per ton.

Therefore, EPA is considering *limited* amounts of litter and manure sales with those model farms corresponding to the geographic regions where the data indicates manure is sold. EPA solicits comment on the costs and data used with this approach, and solicits comment on EPA's calculated value of $8 per ton for litter. EPA notes it does not intend to use retail values for value added manure, but will use the information in support of considering cost offsets due to manure value. EPA solicits comment on these data and assumptions.

2. Alternate Data and Information for Estimating Compliance Costs

This section describes additional cost data and information obtained by EPA to address concerns about its cost methodology to estimate compliance costs. This section also presents corrections to EPA's estimated compliance costs as well as clarification on cost information presented in the preamble to the proposed rulemaking.

a. Alternative Costs and Information to EPA's Ground Water Assessment

EPA proposed all new sources and existing beef and dairy farms must provide a certification that the ground water in their area is not hydrologically connected to surface water. Without a certification, facilities must monitor the ground water surrounding the manure storage areas and take necessary measures to ensure no discharge to ground water that is hydrologically connected to surface waters. Some stakeholders stated EPA's cost estimate for obtaining the assessment

(approximately $3,000) is reasonable only if the statement is based on a site visit and records review with no intrusive sampling. However , these stakeholders believe even if there is no hydrologically connected ground water on a site, it will be difficult for a permit applicant to obtain a hydrologist's statement to this effect that is acceptable to the permitting agency. Several vendors indicated such an assessment would require additional soil core sampling and monitoring data, and a certified statement that proves the absence of a direct hydrological connection to ground water to the satisfaction of the permitting agency would probably cost two or three times as much as EPA proposed. EPA solicits additional comment on the costs of obtaining a hydrologist's certification.

EPA is considering alternatives to the assessment that might reduce costs and burden. Under one alternative, EPA would require ground water controls at a given site based on certain high risk geographical criteria. EPA would consider sandy soils, karst topographies, and shallow ground water tables, among other factors, in its determination of high risk criteria. As described in Section IV, EPA solicits comment on an option that would define the high risk criteria that would automatically trigger the requirement for additional ground water controls, replacing the cost of an assessment.

b. Gas Collection Systems and Cover Materials for Proposed Technology Option 5

As part of proposed technology option 5, EPA estimated the cost of flares for covered lagoon systems for all swine facilities. EPA has solicited additional comment on the feasibility of technology option 5, and will continue to evaluate the costs and affordability of such technologies. In particular EPA will consider its estimate of costs associated with the gas collection systems and the installation costs of the cover materials. EPA will also reconsider the gas collection system costs for certain veal operations that employ open lagoons for storage. EPA solicits additional data on the component costs for covered lagoon systems, such as cover materials, additional berm development for anchoring the cover, flotation and ballast systems, and sump pump systems. EPA also solicits additional data and information on the operation and management of gas collection systems, such as automated flares.

c. Engineering Costs for Nutrient Management Planning Costs

EPA intends to use the USDA Cost and Capability Study to update the costs of nutrient management planning. In particular, EPA will add a one-time fixed cost for engineering assessments associated with the development of a Comprehensive Nutrient Management Plan. EPA will also reevaluate the costs of hiring a certified consultant to write or approve the plan. Data provided by the University of Tennessee suggests the cost for a certified planner ranges from $50 per hour to $125 per hour. Other comparable data sources in the record include state assessments of nutrient management costs, watershed level experiences with comprehensive nutrient management plan implementation, and vendor supplied costing information. EPA solicits additional comment on the component costs of nutrient management planning such as engineering assessments, mapping and planning activities, and the annual record keeping costs associated with nutrient management.

d. Correction to EPA's Compliance Costs and Economic Analysis Due to Omitted Costs for a Subset of Hog Operations

In the cost analysis supporting the proposed CAFO regulations, EPA inadvertently omitted the cost of impermeable lagoon covers for a subset of hog operations under the proposed BAT Option 5 (refers to EPA's proposal to require nitrogen-based and, where necessary, phosphorus-based land application controls of all livestock and poultry CAFOs, with the additional requirement that all hog, veal, and poultry CAFOs must also achieve zero discharge from the animal production area with no exception for storm events). The subset of operations that were not correctly costed in the analysis included hog operations classified as ''Category 3'' operations, which are assumed to represent CAFOs without adequate landbase for application of manure on cropland; Category 3 CAFOs are those operations that would likely need to transport manure offsite for alternative use or to be spread as fertilizer. This cost omission in EPA's analysis does not affect any other livestock or poultry sectors or other land-use categories (Category 1 and Category 2 CAFOs) in EPA's cost analysis.

The number of hog operations with understated costs due to the omission of lagoon cover costs includes 210 hog operations, or about 1 percent of the total number of 14,370 hog facilities assumed in EPA's analysis. By broad facility size grouping, an estimated 81 hog operations with more than 1,000 AU and 129 hog operations with fewer than 1,000 AU were undercosted.

EPA estimates that the effects of these omitted costs understates EPA's estimated total compliance costs for the hog sector as follows. These omitted costs would result in additional capital costs to hog facilities of $33 million to $68 million over a 10-year period (1997 dollars). On an annual basis, additional costs to the hog sector would total $5 million to $10 million, or a 2 percent to 3 percent increase in estimated industry costs (based on EPA's original cost analysis that estimated costs to the hog sector at $294 million to $306 million per year). Expressed on a per-hog basis for this subgroup of hog operations, the additional annual cost to hog facilities could be as much as $3 to $5 per marketed hog. This represents a 75 percent increase in estimated per-head costs compared to EPA's original estimate at $4 to $7 per head (post-tax) for Category 3 CAFOs in the hog sector.

If these omitted costs were considered in EPA's analysis that evaluates financial impacts to the hog sector, this would raise the estimated total number of hog operations that would be considered to experience financial stress and be vulnerable to facility closure as a result of the proposed regulations. Assuming a worst-case scenario, all of the 129 hog operations with fewer than 1000 AU without landbase for manure application might close. (All 81 hog operations with more than 1,000 AU without landbase for application were already projected to close in EPA's original economic analysis.) This would raise the total number of hog operations that would be vulnerable to facility closure to 1,550 hog operations, up from EPA's original estimate of 1,420 hog CAFOs projected closures. As a percentage of all hog CAFOs, hog operations projected to close would total more than 22 percent of all CAFOs in the hog sector, up from EPA's original estimate of 17 percent of hog CAFOs projected to close as a result of the proposed regulations. EPA has not yet evaluated this change in financial impacts under a cost passthrough scenario. (EPA's original analysis showed that all 1,420 hog CAFOs would be able to afford EPA's estimated compliance costs under a scenario of long-run market adjustment and cost passthrough.)

EPA will consider these costs and projected economic impacts when reviewing alternative technology options for the final rulemaking.

e. Correction to EPA's Summary of the Range of Estimated Compliance Costs Across All Proposed Technology Options

In the preamble to the proposed rulemaking, EPA provided a summary table listing the range of annualized compliance costs developed for EPA's analysis. This table presented the range of estimated costs across all the technology options considered by EPA but inadvertently failed to reflect the full range of costs estimated by EPA across all of the proposed technology options. Even though EPA is in the process of revising all its cost estimates based on new information and is incorporating changes to its cost models in preparation to develop the final CAFO regulations, today's notice presents corrections to this table to clarify omissions to information presented previously for the proposed rulemaking.

Costs presented in the preamble to the proposed rule (Table 10–1, see 66 FR 3083) listed annualized costs for each sector, summarized across the estimated range of minimum and maximum costs across all facility sizes, production regions and land use category. Prior to publication in the **Federal Register**, this table was not updated to reflect EPA's final cost estimates, as well as expected higher compliance costs, to some facilities under the proposed BAT Option 3 (refers to EPA's proposal to require nitrogen-based and, where necessary, phosphorus-based land application controls of all livestock and poultry CAFOs, with the additional requirement that all cattle and dairy operations must conduct ground water monitoring and implement controls, if the ground water beneath the production area has a direct hydrologic connection to surface water). However, these costs were correctly documented in EPA's *Economic Analysis of the Proposed Revisions to the National Pollutant Discharge Elimination System Regulation and the Effluent Guidelines for Concentrated Animal Feeding Operations* (referred to as ''Economic Analysis''). In addition, all the costs and financial impact results presented in subsequent sections of the preamble (66 FR 3084–3103) were correctly evaluated based on EPA's final compliance cost estimates for the proposal.

Corrections to these estimated annualized costs are presented in Table 5–9 (1999 dollars, post-tax). In this table, upper bound costs for the cattle sectors reflect higher costs associated with operations where there is a hydrologic connection from ground water to surface waters at the CAFO. These higher costs reflect the need for ground water controls and monitoring at some operations (referred to in EPA's supporting analyses as Option 3A costs). The previous table shown in the preamble only presented average cost conditions across all operations—both operations with and without a hydrologic link (referred to as Option 3 costs). Compared to the original estimates previously presented by EPA, these costs are in some cases much higher, especially in the beef and dairy sectors. Data presented in Table 5–9 would replace information previously presented by EPA in Table 10–1, published in the **Federal Register** notice of the proposed rulemaking (66 FR 3083). EPA's Economic Analysis for the proposed rule provides more detailed cost information, including annualized costs broken out by production region, land use category, and broad facility size groupings, as well as costs expressed on a per-head inventory basis.

As part of EPA's ongoing efforts to develop final regulations for CAFOs, EPA is reviewing the data, methodology and assumptions that were used to its develop estimated compliance costs assumed for the proposed rulemaking and, in some cases, might use alternative data and information to develop its compliance cost estimates for the final CAFO regulations. Consequently, EPA's final cost estimates will likely undergo further refinement and revision and might vary from those presented in this notice.

TABLE 5–9.—RANGE OF ANNUALIZED MODEL CAFO COMPLIANCE COSTS ($1999, POST-TAX)

Sector	Category 1		Category 2		Category 3	
	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum
	(1999 dollars per model CAFO across all size groups)					
Beef	$2,100	$984,500	$7,300	$1,217,900	$1,000	$895,400
Veal	1,500	7,800	1,100	6,100	1,000	6,000
Heifers	1,500	37,300	1,600	42,300	1,000	34,700
Dairy	3,600	148,100	4,100	179,300	2,600	143,600
Hogs: GF	300	52,300	1,400	63,500	7,000	81,400
Hogs: FF	300	83,800	1,300	100,500	5,900	115,300
Broilers	3,600	36,300	3,400	25,800	2,900	21,300
Layers: wet	300	24,800	2,100	29,300	1,500	18,000
Layers: dry	900	59,000	900	31,600	700	27,600
Turkeys	2,500	111,700	2,500	29,400	1,700	20,800

Source: EPA. Category 1 CAFOs have sufficient cropland for all on-farm nutrients generated; Category 2 CAFOs have insufficient cropland; and Category 3 CAFOs have no cropland. ''Hogs: FF'' are farrow-finish (includes breeder and nursery pigs); ''Hogs: GF'' are grower-finish only. ''Layers: wet'' are operations with liquid manure systems; ''Layers: dry'' are operations with dry systems.

C. Data and Analytical Approach To Estimate Financial Impacts to CAFOs

This section describes alternative data and approaches that EPA is considering to address commenters' concerns about its economic model and associated input data and assumptions to evaluate financial impacts to regulated CAFOs.

1. Alternate Analytical Methodology for Determining Economic Achievability

For the proposal, EPA developed an economic model to assess financial impacts to regulated CAFOs based on predicted changes to select financial criteria. As introduced in Section II.B.4 of today's notice, researchers at FAPRI have conducted a review of EPA's economic analysis at the request of the Committee on Agriculture, United States House of Representatives. The results of this study were submitted to EPA for its consideration. The stated purpose of FAPRI's study was to provide EPA with an alternative methodology of calculating the expected financial impacts to CAFOs under the proposed regulations. Although the results of FAPRI's analysis are not

directly comparable to EPA's own analysis because the underlying model and input data are different, FAPRI's results do indicate some degree of sensitivity in the conclusions of EPA's economic analysis using different input data and modeling assumptions. FAPRI's study also provides EPA with additional information and suggested approaches for further refining and improving its economic model to assess financial impacts to regulated CAFOs. Today, EPA presents two alternative approaches that the Agency is considering to modify and refine its existing model.

The economic model that EPA used to evaluate financial impacts to CAFOs under the proposed regulations uses a representative farm approach. Such an approach is consistent with research conducted by other industry experts, including FAPRI. This approach provides a means to assess average impacts across numerous facilities by grouping facilities into broader categories to account for the multitude of differences among animal confinement operations. Under this general framework, EPA constructed a series of model facilities (''model CAFOs'') that reflect the EPA's estimated compliance costs and available financial data. EPA uses these model CAFOs to develop an average characterization for a group of operations based on certain distinguishing characteristics for each sector, such as facility size and production region, that may be shared across a broad range of facilities.

For the proposal, EPA evaluated the economic achievability of the proposed regulatory options at existing animal feeding operations based on changes in representative financial conditions across three criteria. These criteria include: a comparison of incremental costs to total gross revenue (sales test), projected post-compliance cash flow over a 10-year period, and an assessment of an operation's debt-to-asset ratio under a post-compliance scenario. EPA used the financial criteria to divide the impacts of the proposed regulations into three impact categories: affordable, moderate, and financial stress. Operations experiencing affordable or moderate impacts are considered to have some financial impact on operations at the affected CAFOs, but EPA does not consider these operations to be vulnerable to closure as a result of compliance. Operations experiencing financial stress impacts are considered to be vulnerable to closure post-compliance. More information on these criteria is provided in the proposal (66 FR 3088). Additional information on EPA's economic models is available in EPA's Economic Analysis; EPA's cost models are described in EPA's Development Document.

Specific recommendations on how EPA might improve its modeling framework include an expansion of the types of financial criteria that EPA examines and incorporation of uncertainty into the analysis, along with other suggestions on the use of various modeling assumptions and input data to depict financial conditions at the facility. For example, many commenters recommend that EPA evaluate impacts in terms of additional profitability criteria, such as return on assets or equity, internal rate of return, profit margins, or returns to labor and overhead before taxes. Many commenters also point to FAPRI's baseline model which generates results that place probability distributions around each of the point estimates of the baseline. By comparison, EPA's economic model used for the proposal, utilizes a point estimate deterministic approach—an approach that is consistent with recent regulatory analyses of financial impacts of many EPA regulations. Many representatives of the major trade associations and researchers at USDA publicly endorse FAPRI's suggested modeling approach and the results of its analyses.

FAPRI's comments to EPA's CAFO rule generally focus on the process EPA adopted to develop cost and economic analyses to support the proposed rulemaking rather than to address specific policies in the proposed CAFO regulations. To review EPA's economic analysis, FAPRI assembled industry experts to help construct alternative CAFO models and designed spreadsheets to, first, construct a financial baseline for each operation and, second, to analyze the impact of the proposed CAFO regulations. (FAPRI did not develop alternative compliance cost estimates but instead used EPA's estimated costs for the proposal.) The underlying model that FAPRI uses for its study is its 2001 long-term agriculture baseline model that is used to analyze agriculture policy requests from the U.S. Congress. This model consists of a large scale econometric model of both U.S. and world agriculture containing roughly 5,000 behavioral equations and identities. Additional detailed information about FAPRI's baseline model is available at http://www.fapri.missouri.edu. FAPRI's reports on EPA's cost and economic analysis are available in the record and at FAPRI's website: http://www.fapri.missouri.edu/FAPRI_Publications.htm.

At the market level, FAPRI's analysis is largely in agreement with EPA's economic analysis in terms of the magnitude of market price increases associated with production shifts due higher production costs from complying with the regulation. However, at the representative CAFO level, FAPRI's analysis generates a different set of results with respect to financial impacts based on its use of alternative input data, assessment criteria, and methodology for determining impacts. As a result of this review, FAPRI identified several areas of concern associated with EPA's analysis that assesses the financial impact to CAFOs. These range from the way in which EPA tracked the cost components to the basic approach used by EPA related to the financial viability of the respective CAFO operations. Other concerns highlighted by FAPRI's report are recommendations that EPA conduct its analysis on an enterprise basis only and also consider an operation's ability to incur new debt, among other analytical issues.

Based on these comments, EPA is considering ways to further refine the analytical models and assessment criteria that it uses to determine financial impacts to regulated CAFOs, as well as consider the use of alternative input data for conducting this analysis. This section describes the approaches that EPA is considering to refine its financial impact models. As discussed below, EPA would potentially add modules to its existing economic model and incorporate changes to various assumptions as well as additional financial data, but would retain the basic internal structure of EPA's existing economic model. These model refinements are described in the following subsections and include: addition of new assessment criteria to evaluate changes in profitability (Section V.C.1(a)); examination of impacts at both the farm and enterprise level (Section V.C.1(b)); revision of threshold levels on a debt-to-asset test for some sectors (Section V.C.1(c)); considerations of debt feasibility (Section V.C.1(d)); and consideration of various assumptions by EPA in its analysis for the proposal, including whether to use post-tax costs and other cost offsets that may be available to producers, such as cost share assistance and income from manure and litter sales (Sections V.C.1(e) and V.C.1(f)). EPA solicits comment on these approaches to further refine its economic impact analysis and, where indicated, EPA requests additional information to

follow through on these suggested modifications.

Section V.C.2 of this notice describes additional sources of data to depict baseline financial conditions that the Agency is considering to supplement available financial data provided by USDA that was used for the proposal.

At this time EPA is not proposing an alternative, more comprehensive overhaul of EPA's existing model based on recommendations by some commenters that the Agency instead design an entirely new modeling framework. Nevertheless, Section V.C.1(g) concludes with a brief discussion of a possible alternative approach for further refining EPA's model by incorporating an extensive sensitivity analysis within its baseline process and providing a fuller treatment of the range of expected outcomes than would be the case with only a point estimate deterministic approach, as used by EPA for the proposal. EPA also solicits comment on the use of such an alternative approach.

a. Inclusion of New Assessment Criteria to Measure Changes in Profitability

As described in more detail in the preceding introduction, for the proposal, EPA evaluated the potential financial impacts of the proposed regulatory options based on changes in representative financial conditions across select criteria. Among these criteria were a comparison of incremental costs to total gross revenue (sales test), intended to broadly measure changes in a regulated facility's profitability under a post-compliance scenario. This test was largely considered as a screening test for further analysis and assessment using discounted cash flow analysis and an assessment of an operation's debt-to-asset ratio.

Several commenters claim that the sales test is not a useful measure of whether producers can afford the regulations. They suggested that it should be replaced with a rate of return measure, such as return on assets, equity, or investment. One commenter suggested a criterion based on cost as a percent of profit margin (measured as revenue less cost of goods sold) or gross margin (measured as returns to labor and overhead before taxes). Another commenter recommended evaluating profits measured as earnings before interest, taxes, depreciation, and amortization (EBITDA). Others indicated that the sales test, if retained, should be measured against a lower threshold value due to the lower profit margins on sales in agriculture. In general, commenters state that potential impacts, even at lower cost-sales ratios, can result in proportionately large reductions in net returns and erode the attractiveness of reinvestment in animal agriculture.

To address these concerns, EPA is considering adding additional assessment criteria that would measure changes in an operation's profitability from complying with the regulations. One potential criterion would assess compliance costs as a share of profit margin or, alternatively, EBITDA (''profit test''). EPA is considering a 20 percent to 30 percent threshold value on a profit test, for profits measured as revenue less cost of goods sold, but not including returns to unpaid labor and overhead. Using this threshold value, if compliance costs as a share of profit margin is less than 20 percent this would be considered affordable; compliance costs as a share of profits greater than 30 percent could indicate potentially significant impacts. This proposed threshold range is consistent with past analyses supporting regulatory actions by EPA, including standards for pesticide containment structures under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), arsenic residue standards for preserved wood, and also regulations under the Resource Conservation and Recovery Act (RCRA). Additional supporting information for this proposed threshold value is provided in EPA's record. EPA solicits comment on the use of this additional criterion and the range of suggested threshold values to evaluate this criterion. EPA will consider adding this criterion to the extent that the available financial data for each of the affected regulated sectors allow.

EPA requests comment on alternate profitability thresholds and the basis for them. EPA also solicits comment and requests information on the use of a profit test and applicable threshold values for this test should EPA use available USDA financial data that defines ''net farm income'' to include depreciation and interest, as well as other nonmoney expenses and returns to unpaid farm labor.

EPA did consider evaluating regulatory impacts to CAFOs using profitability measures for the proposal, but decided not to include such criteria because of limitations in the financial data available to EPA to conduct its regulatory analysis. Specifically, given boom and bust conditions that are common in the agricultural sectors, these financial data often show negative returns to risk, management, and unpaid labor. Consequently, the only way for EPA to conduct its analysis using these data is either to assume it is a baseline enterprise closure (i.e., it should not be considered in the regulatory analysis since the operation would be discontinued even without considering the impact of the regulations) or to determine that the operation cannot be analyzed at this level (i.e., the operation is remaining in business because of certain mitigating factors). EPA often encounters such problems when analyzing certain multi-facility manufacturing or service firms in other EPA regulations using actual facility level data; in such cases the facility is removed from the analysis since it cannot be analyzed and is considered a baseline closure.

However, in the case of the analysis supporting the CAFO regulations, EPA is using a representative farm approach since it did not conduct a survey of all CAFOs nationwide. Using aggregated published data, this approach analyzes impacts across select groupings of livestock and poultry operations based on certain shared characteristics (e.g., animal production, region, facility size, etc.). Therefore, if the financial data for a certain representative group show negative returns under EPA's traditional approach, EPA would need to consider all operations within a group as a baseline closure. Financial data presented in Tables 5–10 through 5–12 provide an indication of which sectors would likely show large numbers of baseline closures given available data using a profit test with USDA's definitions of net farm income (which includes depreciation and nonmoney expenses). For example, as shown in Table 5–11, if EPA were to use alternate 1998 hog data from USDA, EPA's traditional approach would assume that all operations within each of the representative groups are baseline closures. However, EPA recognizes that when available data show large numbers of baseline closures (including even whole sectors), this may indicate limitations with the underlying data and/or methodologies rather than a realistic picture of the industry. EPA is further aware that facilities identified as baseline closures under EPA's traditional approach may be the very facilities likely to experience stress as a result of additional compliance costs, and that it is therefore important to account for these facilities in the analysis.

For proposal, EPA evaluated impacts using a sales test and not other profit measures. If EPA decides to adopt a profit test as part of its final analysis, EPA will need to consider ways to address concerns regarding the potential number of large baseline closures using available data for operations that show

negative returns. A possible approach that might avoid this concern would be to consider compliance costs as a share of net income excluding depreciation and nonmoney expenses as part of the profit test (e.g., profits defined as profit margin or EBITDA). However, available financial data may be limited to allow for this level of differentiation among individual accounting line items. EPA solicits additional comment on these concerns.

Because of these concerns, EPA is also considering other profitability criteria, including return-on-assets (ROA) and return-on-equity (ROE). ROA is measured as the percent profit before taxes as a share of total assets in the RMA data. ROE is measured as the percent profit before taxes as a share of tangible net worth. EPA has evaluated changes to ROA as a measure of impact in previous effluent guidelines analyses, including analyses for the pharmaceutical manufacturing industry and the pesticide formulating, packaging and repackaging industry. The benchmark that has been used for these criteria are based on data reported by Robert Morris Associates (RMA). Each year, RMA surveys a number of operations in most sectors of economy, including agriculture, to gather basic financial data on which to report various balance sheet and income statement items, as well as key financial ratios. In previous analyses by EPA, it was assumed that operations that are at risk of closure or bankruptcy under a post-compliance scenario are those with, for example, estimated ROA higher than the lowest quartile of value in the baseline that are determined to have ROA below the lowest quartile value reported by RMA after complying with the regulations. Because of issues related to data indicating negative returns within some of these sectors (as discussed previously), the proposed benchmark values using this approach are negative. Accordingly, for the CAFO analysis, EPA has determined that the following relevant ROA and ROE lowest quartile benchmarks would apply based on RMA for 1994–1997: lowest quartile ROA ranges from -0.4 percent for hog operations to -4.3 percent for egg operations; lowest quartile ROE ranged from -0.4 percent for dairy operations to -10.7 percent for egg operations. These benchmarks are preliminary and subject to modification using additional data to ensure a representative ROA or ROE benchmark has been identified. Additional supporting information for these proposed threshold values is provided in EPA's record. EPA solicits comment on the use of these alternative criteria and also the range of suggested threshold values to evaluate these criteria. EPA will consider adding these criteria to the extent that the available financial data for each of the affected regulated sectors allow.

b. Evaluation of Assessment Criteria at Multiple Business Levels

In the proposal, EPA evaluated financial impacts using USDA Agricultural Resource Management Study (ARMS) data that were aggregated at the farm level. EPA's basis for determining economic achievability among regulated CAFOs was therefore measured in terms of the potential for closure of the facility and not as a potential product line closure. Among the principal concerns raised in the FAPRI study as well as by researchers at the land grant universities and also USDA is that EPA should evaluate financial impacts to regulated CAFOs for the single regulated livestock or poultry enterprise only.

Many commenters claim that EPA's use of farm-level financial data raises questions as to whether a CAFO would willingly subsidize one enterprise with dollars from other farm enterprises. These commenters question whether producers at more diversified operations would choose to cross-subsidize an unprofitable enterprise for long periods or whether they would instead shift assets towards other, more profitable enterprises at their operation; these producers might not quit farming but would only remove the non-productive enterprise from their farming mix. Moreover, some commenters point out that larger operations are normally enterprise specific and tend to specialize and focus on a single enterprise and, therefore, an enterprise approach is considered more appropriate for EPA's analysis. Other commenters also note that the use of enterprise level data in the form of ''enterprise budgets'' is more consistent with a representative farm approach, which was the general approach adopted by EPA for evaluating financial impacts for the proposal. FAPRI also noted that while an evaluation of impacts at the farm level has merit, it is also prone to confounded results because enterprise specific costs are spread over a larger share of the business (e.g., non-livestock enterprises bear the cost of livestock regulatory costs).

EPA recognizes the importance of considering financial impacts at multiple levels within a business since this is consistent with economic theory and a more technically sound approach. EPA typically conducts its analyses of regulated entities using data for a business as a whole as opposed to an individual product line at a firm. The main reason for this is that data are often not available at the enterprise or product line level. Similarly, data limitations restricted the types of analyses EPA was able to conduct to support the proposed CAFO regulations; because the available ARMS data obtained by USDA did not provide usable data and information for an individual enterprise at a model facility, EPA was not able to evaluate impacts at the enterprise level. Instead, the ARMS data available to EPA were expressed for an operation's entire business, which includes revenue and cost information across all enterprises at a facility. Although the ARMS data's revenue information is roughly distinguishable between gross income from total livestock production and revenue from other farm source (including crops, government payments, and other farm-related income), the operating cost data are not differentiated by an operation's livestock enterprise but are reported as total cost and reflect joint production and labor costs across all the different enterprises at a facility.

Today, EPA presents options that the Agency is considering to modify its economic analysis to take into consideration new financial data received by EPA in order to assess financial impacts at multiple businesses levels within a representative facility. This addresses recommendations received through public comment in conjunction with new financial data that has been provided to or compiled by EPA at the enterprise level for some sectors (presented in Section V.C.2 of this notice). EPA is considering whether to use these enterprise data to supplement the farm level data used by EPA for the proposal.

Given the availability of these new data for some sectors, EPA is considering an approach that would supplement available data at the farm level with data at the enterprise level. EPA has adopted such an approach for previous regulations where data are available (e.g., regulations related to the Pesticide Formulating, Packaging and Repackaging industry which were evaluated according to product-line closures, see 61 FR 57518). For this analysis, EPA is considering using available financial data to assess changes in a representative facility's profitability based on changes at both the farm and enterprise level. EPA proposes to continue to evaluate changes in solvency using a debt-to-asset test at the farm level. Any additional considerations of a debt

down payment requirement, as discussed later in Section V.C.1(d), would also be assessed at the total farm level. EPA's discounted cash flow analysis will continue to be conducted using farm level data. Using this approach, EPA is considering ways to evaluate the financial impacts of the proposed regulations that consider impacts at these multiple business levels (e.g., both the farm and enterprise sector) to differentiate circumstances under which an enterprise or product line may be discontinued but the farm or larger business entity remains in operation. While closure of the farm business is the focus of EPA's analysis, several commenters have expressed concern about enterprise closure for reasons of risk diversification and industry concentration. EPA solicits comment on the use of this approach and also requests additional input from the public on how to reconcile these issues for purposes of assessing financial impacts to regulated CAFOs for the final rulemaking.

EPA is not considering evaluating financial impacts at the enterprise level only, as some commenters have recommended. One reason for this is that usable enterprise level data are not available across all sectors in order to be able to complete such an analysis. In addition, some components of EPA's analysis are simply only appropriate when conducted at the farm level, such as EPA's standard discounted cash flow analysis or an assessment of an operation's debt. Moreover, EPA is unlikely to ignore available farm level data for some aspects of its analysis. For example, it is a long-standing practice and consistent with Agency guidance to assess impacts to small businesses at the broader business level, as part of EPA's obligation to conduct a regulatory analysis of the impacts to small businesses under the RFA. Furthermore, previously published academic research by both the land grant universities and USDA have typically evaluated impacts using data and methods specified at the farm level or have, at least, taken into consideration information for the larger business concern.

EPA's alternate proposal to supplement available farm level data with new enterprise level data also addresses concerns that EPA has about evaluating impacts at the enterprise level only. These are summarized briefly as follows. As a practical matter, EPA recognizes that often the individual enterprises at an operation are highly interdependent, such as in the case of integrated production systems where there may be considerable cost savings due to shared production and labor costs among multiple enterprises at a farm or as in the case of where one enterprise, e.g., grain crop production, serves as an input to another, e.g., livestock production. In addition, an analysis using enterprise level data may fail to account for the range of assistance to the farming operation through various government programs, which are often noted as a separate source of farm level income in USDA's data compendiums. Also, as pointed out by one lender questioned by EPA, lenders usually look at the debt carrying capacity of the farm operation as a whole, except in the unusual instance when their lien is only on the enterprise. Finally, farms are commonly noted to be motivated by non-economic factors that may influence an operation's decision to weather the boom and bust cycles that are commonplace in agricultural markets. These issues raise questions about whether a decision to conduct EPA's analysis strictly at the enterprise level is simple and straightforward. EPA requests information on how to reconcile these concerns in the context of its analysis.

As part of this approach, however, EPA is not considering modifying its existing economic models to take into consideration financial data for processing firms. Such an approach has been suggested because of the affiliation between some CAFOs (e.g., contract growers) and processing firms through various contractual arrangements in some sectors. Data are not available to conduct such an analysis: EPA does not have market information on which processors and CAFOs participate in such contract agreements; financial data for processing firms that contract out the raising of animals to CAFOs is also not available. Consistent with how EPA conducted its analysis for the proposal, EPA will continue to assume that an assessment of the regulatory impacts of the proposed regulations is more accurately conducted for the regulated CAFO since the CAFO is the operation that would incur the cost of the proposed requirements. EPA solicits comment on this assumption and overall approach. Although EPA is not considering evaluating the financial impacts of the proposed regulations at the processor or integrator level, EPA will continue to evaluate expected broader market level changes using the assumptions of cost passthrough that were developed for the proposal as a surrogate for more complex market level models that would appropriately take into account structural adjustment among farmers as well as market adjustment in the long run.

At this time, EPA has not re-evaluated its analysis using the approach presented in this notice that would determine regulatory impacts based on both farm and enterprise level financial data. However, EPA did evaluate available enterprise level as part of its sensitivity analysis of its study results for the proposal. The results of this sensitivity analysis provide an indication of the potential changes that might occur if enterprise level data are evaluated in conjunction with farm level data used as discussed in this notice. For this assessment, EPA evaluated changes to its sales test criterion using USDA data for total livestock revenue only (i.e., excluding revenue from all other sources, including crops, government payments, and other farm-related income). This approach differed from EPA's main analysis where cost-to-sales ratios were evaluated using financial data for the farm operation as a whole and does not differentiate between an operation's livestock and other business enterprises. EPA was not able to evaluate changes in other financial criteria because enterprise level data was not available with respect to an operation's operating costs. This analysis is provided in Appendix D of EPA's Economic Analysis that supports the proposed rulemaking.

Table 5–9 presents the results of this analysis as well as a comparison of gross revenue at both the enterprise and farm business levels assumed in this sensitivity analysis, expressed on a per-animal basis. Overall, consideration of enterprise level data only could result in these operation's being depicted as having lower ability to pay for additional compliance costs, as compared to consideration of broader farm level data. EPA's analysis using only enterprise level data resulted in an increase in the assessed number of enterprise and potentially farm closures. As shown in the table, the reported USDA data show that livestock revenues comprise roughly one-half of a farm's total operating revenue for most sectors. In the broiler sector, enterprise revenue is about 10 percent of that reported for the entire operation: business revenue is $1.10 to $1.50 per bird when expressed at the farm level, as compared to $0.10 to $0.20 per bird when expressed at the broiler enterprise level only. As is also shown in the table, if cost-to-sales ratios at the enterprise level are assumed to be the sole basis for determining whether the proposed regulations are affordable, the number of potential product line failures would increase significantly as compared to an assessment using farm

level data only. These results do not take into consideration the potential offsetting effects of cost passthrough and longer term market adjustment. In addition, EPA considers the results of this analysis for some operations, particularly broiler operations, to be overstated since this simple test does not take into consideration lower production costs at contract grower operations where production inputs are often provided by the affiliated processor firm under various contractual agreements.

EPA solicits comment on EPA's intention to supplement available farm level financial data with new data received at the enterprise level, and to use these data to determine economic impacts to regulated CAFOs.

TABLE 5–9.—COMPARISON OF INPUT DATA AND RESULTS USING ENTITY (MAIN) AND ENTERPRISE (SENSITIVITY) DATA

Sector	Number of CAFOs	Input revenue data		EPA's analysis result	
		Main analysis entity level revenue/head	Sensitivity analysis enterprise level revenue/head	Main analysis number of CAFOs financial stress	Sensitivity analysis number of CAFOs financial stress
Beef	5,330	$502–$862	$340–$512	90	660
Dairy	7,140	$2,343–$2,620	$2,166–$2,650	700	700
Hog	14,370	$84–$606	$47–$307	1,420	3,020
Broiler	14,140	$1.10–$1.40	$0.10–$0.20	320	14,140
Layer	2,060	$25.00	$17.00	0	0
Turkey	2,100	$11.0–$20.0	$6.0–$17.0	0	100
Total	45,140	n/a	n/a	2,520	18,610

Source: Input data are from USDA's 1997 ARMS data, derived on a per-animal basis. Data used for sensitivity analysis are derived from the data in the main analysis, based on USDA-reported livestock portion of total farm revenue only and disregards revenue from other farm-related sources, including crops.

EPA's analysis compares results in terms of the number of operations that might experience financial stress between the main (entity) and sensitivity (enterprise) analysis (shown for the proposed technology options all operations with more than 300 AU).

c. Revision of Threshold Values on a Debt-to-Asset Test (Some Sectors Only)

For the proposal, data on a representative operation's debt-to-asset ratio were obtained from USDA. These data were used along with other financial criteria to assess an operation's debt-to-asset ratio under a post-compliance scenario and constitute one of the tests used by EPA to assess financial impacts to CAFOs. For the debt-to-asset test, EPA assumed a threshold value of 40 percent, such that if an operation's debt-to-assets measured more than 40 percent after incurring the compliance costs, then EPA might consider this operation to experience financial stress associated with the proposed regulations, subject to other considerations. The basis for EPA's 40 percent test was USDA's financial classification of U.S. farms that identifies an operation with negative net farm income and a debt-asset ratio in excess of 40 percent as ''vulnerable.'' An operation with positive net income and a debt-asset ratio of less than 40 percent is considered ''favorable.'' EPA adopted this classification scheme as part of its economic achievability criteria in assessing the change in debt relative to asset at a regulated CAFO.

Commenters generally approve of using a debt-to-asset ratio in the economic analysis, but criticize the baseline assumptions, how the post-compliance ratio was computed, and the criteria chosen for the threshold. However, some commenters claim that USDA's 40 percent threshold value used by EPA in its baseline model to assess post-regulatory debt-to-asset ratios does not reflect the financial reality of today's livestock or poultry industry. Many commenters also note that debt-to-asset ratios from USDA's ARMS data set do not represent the current state of borrowing in many of these sectors. Specifically, they assert that the ARMS data reflect a current debt position that is too low, given that most operations face higher debt levels; also, these data reflect an assumed equity position of more than 60 percent that is considered too high to be representative of the livestock and poultry industry. Commenters indicate that some operations typically are highly leveraged, especially those operations that finance a large portion of their livestock.

Several commenters noted that EPA's use of average debt-to-asset ratios using the ARMS data fail to account for the wide range of variability among farm operators, based on a variety of factors including facility size and the age of the farm operators. One commenter cited survey data for the hog sector indicating that although average debt-to-asset ratios may fall within a range roughly at the 40 percent threshold, individual operations may operate below or above 40 percent depending on size of operation: generally, the majority of smaller sized operations tended to have debt-to-asset ratios less than 40 percent (roughly 60 percent of operations in that size class) whereas larger operations tended to have debt-to-asset ratios greater than 40 percent (roughly 50–60 percent of operations in that size class). Another commenter noted that operators seeking to expand their operations to better compete may face a higher debt load.

Some commenters support the use of alternate data and assumptions that reflect higher debt-to-asset ratios in the baseline model, approaching 70 percent. Some indicate that a baseline of more than 60 percent is not unusual, with some operations with levels of 70 percent to 80 percent. These comments are generally consistent with new financial data received by EPA that indicates that baseline debt-to-asset levels at some representative facilities in this industry exceeds 40 percent and tends toward 50 percent to 60 percent (see Section V.C.2 for more information).

Because of these comments, EPA is considering revising its debt-to-asset threshold and will look into alternatives to USDA's 40 percent value for those sector where alternative data support this approach (i.e., if EPA uses alternate and/or supplemental data based on submissions by NCBA for cattle feeding operations and FAPRI for hog and dairy operations, as described in Section V.C.2). Most commenters stated that financial stress would occur at operations facing debt-to-assets ratios of roughly 60 percent to 80 percent. One commenter suggested that a ratio of

more than 60 percent would be indicative of stress and that a ratio of more than 70 percent would result in bankruptcy. The basis for this recommendation cites farm credit information from the American Bankers Association's Farm Financial Standards Task Force suggesting that debt-to-asset levels in excess of 60 percent act as ''red light'' indicators to lenders. EPA's own discussions with farm lenders also indicate a 60 percent debt level for ''typical'' operations. Most lenders require an operation to retain a 40 percent equity base in the operation, although lower bases may be acceptable, particularly where the majority of debt is in short-term livestock loans or at very large operations. Therefore, the 70 percent debt-to-asset ratios (reflecting a 30 percent equity stake) at the very large operations represented in the NCBA survey may reflect both of these factors. Another commenter suggested assessing impacts based on the probability that an operation will experience two consecutive years of negative cash balances, in conjunction with a debt-to-asset ratio of greater than 70 percent in the second year of incurring new debt associated with the regulations. EPA requests additional information that further supports these and similar suggestions for modifying the threshold values assumed for purposes of conducting a debt-to-asset test.

Given these recommendations, EPA is considering revising the existing assessment criteria threshold on a debt-to-asset test from a 40 percent level assumed in the proposal, unless EPA obtains substantiated data to the contrary in comments to today's notice. At this time, EPA is considering a threshold value on this test of 60 percent for small and medium operations, and 70 percent to 80 percent for large operations—in certain sectors only. This revised threshold value will be applied as a test within those sectors where available data supports such an approach. At this time, based on available data that EPA has obtained, these revised thresholds will likely be applied within the beef, dairy, and hog sectors only. The basis for this revised threshold value in these sectors is new data obtained by EPA from FAPRI and NCBA indicating that operations in these sectors already carry much higher debt loads than average data reported by USDA. EPA is not considering revisions to the 40 percent threshold value for the debt-to-asset test for the the poultry sectors because available data does not support such an approach. Although a lender survey conducted by EPA indicates that debt levels may also be high within these other sectors, EPA did not receive data or information contrary to that reported by USDA during the comment period. Which applicable threshold level to apply for EPA's analysis will also depend, in part, on which alternate or supplemental data EPA chooses for the purposes of its analysis (for example, if EPA were to use available USDA data then the higher threshold values would not apply). As part of this notice, EPA also requests additional debt and asset data for these sectors, if available.

d. Consideration of Debt Feasibility

For proposal, EPA did not directly assess a representative operation's ability to service new debt. Many commenters criticize EPA for not considering impacts in a way that takes into account all of the cash outlays for an operation, including principal payments on loans to purchase the required technology. These commenters feel that cash outlays in the first year associated with a down payment might be substantial and could critically deplete equity and make second year cash flow requirements difficult. Today EPA presents how it is considering to respond to this comment and solicits comment on this approach.

Many commenters support a general assumption of 40 percent down payment on new debt. The general basis cited for this recommendation is the presumption that capital expenditures associated with compliance are viewed as non-productive investments that are usually sized to a particular operation's needs, therefore they not fungible or saleable as a secondary or tertiary source of repayment for that note and may even have negative value due to costs of removal and disposal. Given these types of single-purpose livestock facility investments, some commenters claim that banks would be reluctant to lend over 60 percent to 65 percent of the total costs. Another commenter made the general claim that a 40 percent down payment assumption is consistent with the typical lender demand that the farm have 40 percent equity in the operation after the loan is made. Few commenters provided documentation from lenders to support a general recommendation of a 40 percent down payment assumption.

Following the close of the comment period, EPA contacted many of the commenters that made this recommendation to solicit additional information on the necessary documentation to support this assumption. In return, EPA received contact information of farm credit specialists and additional information on recommended equity requirements. Because the Agency recognizes the value of taking debt feasibility into consideration, EPA has initiated its own review of what such an assumption would entail, based on information about a typical down payment. As part of this effort, EPA also conducted further evaluation of how lenders assess the ability of an operation to service new debt to determine whether such test is necessary and, if so, how such a test would be incorporated into the Agency's analysis. This section provides a summary of EPA's review. More detailed information is provided in the record.

To review public comments received on this topic, EPA conducted a wider review of documentation on farm lending practices and guidance manuals, as well as contacted each of the farm lender contacts submitted to EPA following the comment period and also other industry credit specialists.

Initially EPA set out to determine a appropriate level of down payment to assume as part of EPA's analysis. Based on EPA's preliminary review of available farm credit information, EPA believes that a 40 percent down payment is not supported by a review of agricultural loan requirements from several agencies. Instead, information collected by EPA supports a down payment assumption of 20 percent to 30 percent. This information is available for review in EPA's record. However, as EPA was reviewing possible down payment assumptions to assume as part of its analysis, it further became clear that the necessary financial data to do such an analysis are limited. Few enterprise budgets report cash reserves, and USDA data do not report cash reserves or cash balances as a line item. As part of its data submission, new data from FAPRI does include ending cash reserves, but these data are available for a limited number of sectors. Without this information, it is not clear whether EPA could evaluate if an operation would be able to provide the necessary cash to make up a shortfall in borrowing. In other words, even if EPA were to determine that it should consider a down payment requirement as part of its analysis, it might not be able to do this because of limitations in the available financial data. EPA requests additional information on first year net cash and/or cash reserves specified at the farm level for these sectors in order to properly apply this recommended debt feasibility test uniformly across each of the sectors. EPA also solicits comment on how EPA would conduct such an analysis given the data limitations and also requests

new information backed by supporting documentation as part of today's notice. Moreover, EPA solicits comment on whether such a test is even necessary, for reasons outlined as follows.

As part of this effort to obtain addition farm credit information to further supplement the Agency's economic models, EPA also investigated how lenders assess the ability of an operation to service new debt. In this process, EPA determined that if an operation has a sufficient equity base, a down payment might be a misleading concept. If a borrower were to take out a fixed term loan for an environmental improvement, a lender would be likely to finance 60 percent of the amount needed, similar to what many commenters pointed out. But the borrower has other choices than cash reserves for the additional funds needed. According to one lender, most farmers have access to other sources of lending limited only by cash flow and equity considerations. For these types of loans lenders are primarily concerned with cash flow and equity base. Operations may typically use their fixed assets as collateral and have access to borrowing (much like a homeowner might have to a home improvement loan) that is limited generally to a point at which their equity base would fall below 35 to 40 percent for a typical operation. This translates to a 60 to 65 percent debt-to-asset ratio on average. Two specialists contacted by EPA indicated that lenders typically demand that the farm have 40 percent equity in the operation after the loan is made. According to one of EPA's contacts, however, borrowers with high levels of equity could borrow up to 100 percent of the necessary funds (and presumably could borrow any necessary down payment under a fixed term loan). Thus as long as their equity base remains sufficient (i.e., they do not exceed their credit line), then obtaining additional funds should not be an insurmountable problem for farms. Stated differently, as long as an operation meets the threshold requirements of a debt-to-asset ratio, the operation should be able to obtain the money needed to meet the requirements of the CAFO regulations as long as cash flow remains sufficient to cover the payments. This would mean that additional tests to account for a down payment requirement as part of EPA's economic analysis are not necessary given the types of analyses (debt-to-asset assessment and cash flow analysis) already in place.

For its analysis supporting the proposed regulations, EPA assumed that operations where the debt-to-asset ratio under a post-compliance scenario exceeded a particular threshold might experience financial stress. These operations are likely those that would have to find ways to finance less than the full amount of the capital expenditure (i.e., make some sort of down payment, in effect, that might entail using any cash reserves, liquidating assets, or undertaking other difficult financial maneuvers). As a practical matter, these operations would be exceeding what might be estimated to be their available credit line. Assuming that these operations are automatically facing financial stress is simpler than trying to determine whether they could somehow manage a 40 percent down payment. Even if EPA was able to determine whether such marginal operations could manage to borrow only a portion of the necessary funds and pay for the rest out of pocket, the data to do such an analysis are limited (as previously noted).

Additionally, at proposal, operations where the equity base is sufficient prior to the regulations, but where the cash flow analysis indicates that they may not be able to cover the annualized costs of the regulations (which include both interest and principal payments, as well as operating costs) are also considered to experience financial stress. This may be considered as equivalent to assuming that lenders would not offer them a credit line sufficient to cover this level of expenditure. Lenders would also have determined that cash flow would not cover this level of debt and consequently would have provided a more limited credit line. EPA thus believes that the analysis performed at proposal that takes into account both the equity base (in the form of the debt-to-asset ratio) and the ability of cash flow to cover annual costs functions in the same way and reflects many of the same decisions used by lenders in granting access to credit.

For reasons presented here, EPA solicits comment on the assumption that a down payment assumption is not necessary given the analysis already in place, including EPA's joint analysis of debt-to-asset ratios and also cash flow. If an operation does not exceed a debt level considered problematic and if the analysis does not indicate cash flow difficulties, EPA would assume that the operation would not face financial stress as a result of the proposed requirements. Consequently, the inclusion of a debt feasibility test that assumes a certain percent down payment in addition to this analysis would not be needed. EPA solicits comment on this assumption and requests that any new information and recommendations as part of today's notice.

e. Consideration of Tax Savings

For the proposal, EPA calculated compliance costs to CAFOs both under pre-tax and post-tax scenarios. The pre-tax costs reflect the estimated total social cost of the proposed regulations, including lost tax revenue to governments. Pre-tax dollars are used when comparing estimated costs to monetized benefits that are estimated to accrue under the proposed regulations. The post-tax costs reflect the fact that a CAFO would be able to depreciate or expense these costs, thus generating a tax savings. Post-tax costs thus are the actual costs the CAFO would face. For this reason, EPA evaluated financial impacts to CAFOs taking into account the tax savings to facilities (i.e., according to estimated post-tax costs) using available Federal and State tax information to compute the expected tax shield for a representative facility. More detail on this approach is provided in Appendix A of EPA's Economic Analysis that supports the proposed rulemaking.

Some commenters oppose EPA's use of post-tax costs to assess financial impacts on the grounds that it is not appropriate to factor tax savings into the cost of compliance for producers. They recommend that EPA base its financial tests without the expected tax offset since operations whose survival is in question would have no positive income against which to offset these ''tax benefits'' but would be forced to bear the full ''pre-tax'' costs of implementation. Related comments recommend that EPA evaluate costs as a share of gross income (''sales test'') using pre-tax and not post-tax costs. In addition, overall commenters have expressed a preference that EPA evaluate compliance cost impacts using various income and profitability measures based on effects prior to consideration of tax offsets (such as net income before taxes).

Previous regulatory impact analyses conducted by EPA have evaluated compliance costs impacts on a post-tax basis using a standard cash flow model, incorporating an annualization approach that accounts for tax savings as well as depreciation at a business since these are more reflective of the costs that are actually incurred by that business. Given this longstanding practice that follows standard business and accounting practices, at this time EPA is not considering revising its approach to assess business impacts as part of the Agency's cash flow analysis.

However, EPA is considering evaluating financial impacts for some financial criteria using both post-tax and

pre-tax costs and will consider whether to jointly include these analyses as part of its overall impact assessment. For example, for proposal, EPA evaluates the ratio of costs to sales using post-tax cost estimates. If EPA retains the sales test as a measure of the impact of compliance, it will consider whether to instead evaluate pre-tax costs of compliance as part of its sales test. If EPA decides to evaluate compliance costs as a share of net farm income, it will consider the use of pre-tax costs for this test as well. EPA solicits comment on this approach.

f. Consideration of Various Cost Offsets

For the proposal, EPA did not consider the range of potential cost offsets available to most farms. One source of cost offset is manure sales, particularly of relatively higher value dry poultry litter. For example, EPA has estimated that sales of dry poultry litter could offset the costs of meeting the regulatory requirements on the order of more than 50 percent; however, EPA did not formally consider this analysis for the proposal. Another source of potential cost offset is cost share and technical assistance available to farmers for on-farm improvements from various State and Federal programs, such as the Environmental Quality Incentives Program (EQIP) administered by USDA. For example, cost sharing for eligible producers under EQIP may cover up to 75 percent of the costs of certain conservation practices, such as grassed waterways, filter strips, manure management facilities, capping abandoned wells, and other practices important to improving and maintaining the health of natural resources in the area. Technical assistance is also available for formulating conservation plans. EPA also did not formally consider these offsets as part of its analysis for the proposal.

Comments by some State representatives have suggested that EPA should account for the availability of cost share and technical assistance in the Agency's cost and economic analysis, including, for example, how producers might use these program dollars to help secure loans for capital investment associated with regulatory compliance. To address these comments, EPA may consider ways to evaluate the potential cost savings to an operation in terms of available cost-share and technical assistance. Such an approach is consistent with various academic studies of economic impact analyses that have been conducted in the past, which often take into account government assistance to a facility as part of an overall assessment. A review of the available literature demonstrating the use of such assumptions is provided in the record. To conduct this analysis, EPA may estimate these cost offsets using an approach similar to that previously conducted for other EPA regulations affecting agricultural producers. For example, available cost share program funding was considered as part of previous analyses of management control measures for CAFOs under the Coastal Zone Management Act, and was estimated at an average rate of $3,500 per facility. EPA anticipates that these estimates will reflect cost share assistance for new capital investments for each representative CAFO model, annualized over the time period of the analysis (and subject to certain program restrictions including program eligibility requirements and other restrictions such as the types of investments covered, as well as overall program funding limitations and availability of program staff to provide assistance.)

In addition, EPA may also consider ways to evaluate the potential income generated and/or cost savings to an operation from the sale or use of manure by the CAFO as a fertilizer substitute. This analysis may be based on the volume of manure nutrients estimated for each representative CAFO model adjusted by the average reported value for these nutrients (according to, for example, market prices for nitrogen, phosphates, and potassium). The use of such an approach is also consistent with much of the academic research conducted by the land grant universities, as summarized in literature review conducted by EPA of previous economic impact analyses to derive an average annual offset.

EPA solicits comment on these approaches to consider various cost offsets to incurred compliance costs, as described in this notice. Also, as part of today's notice EPA requests information from States and others on various conservation and assistance programs, particularly in terms of the amount of program dollars available to livestock and poultry producers through their State level cost-share and technical assistance programs.

2. Alternate Data for Determining Baseline Financial Conditions at CAFOs

For the proposal, EPA did not conduct a survey of all CAFOs to obtain financial budgets for use in its analysis. Instead, EPA relied on financial data from USDA's 1997 ARMS data to evaluate financial impacts at regulated CAFOs. Data for representative farms were obtained by USDA through special tabulations of the 1997 ARMS data, conducted by USDA's Economic Research Service (ERS). These data differentiate financial conditions among operations by commodity sector, facility size (number of animals on site), and major farm producing region. Data that EPA received from USDA were expressed for an operation's entire business and included revenue from an operation's livestock business as well as other enterprises at the facility, e.g., including crops, government payments and other farm-related revenue (but excluding off-farm revenue). Many commenters question the appropriateness of these ARMS data to evaluate financial impacts to CAFOs particularly for certain sectors. Most notably, USDA contends that its ARMS data are not suitable for evaluating impacts to cattle feeding and hog sectors. Other related issues about the ARMS financial input data include concerns about the fact that these data are specified at the farm level and are for a single year only (1997).

Today EPA presents additional data collected by EPA and also data received for the cattle feeding and hog sectors from USDA, National Cattlemen's Beef Association (NCBA), FAPRI, and other sources (Sections V.C.2(a) through (c)). Following a description of the alternate and supplemental financial data received or obtained by EPA is further discussion of sources of alternate data for other sectors that EPA will consider for use in its analysis to address concerns about the use of a single year of data (Section V.C.2(d)) and also how to forecast out data in EPA's financial models over the 10-year analysis period ((Section V.C.2(e)).

a. Alternative Financial Data for Cattle Feeding Operations

During the development of the proposed rulemaking, EPA received alternative enterprise level data for the cattle feeding sector from National Cattlemen's Beef Association (NCBA). These data provided aggregated summary information on financial conditions at cattle feeding operations based on responses to a survey questionnaire of its membership. After a review of these data, however, EPA decided—for reasons discussed below—not to base its economic analysis using NCBA's data for the proposal. Instead, given the lack of other statistically validated survey data for this sector, EPA used USDA's 1997 ARMS data for beef operations despite recognition of the limitations of these data for assessing cattle feeding operations. Both prior to EPA's proposal and during the comment period, NCBA expressed concern that the ARMS data are more

reflective of cow-calf operations and represent few feedlots and, therefore, might not be representative of operations in this sector. In addition, USDA has indicated to EPA that the available ARMS data are more reflective of cow-calf operations and might not suitable for evaluating impacts to cattle feeding operations. Iowa State University also notes the inappropriateness of ARMS financial data to represent beef feedlots.

EPA decided not to use NCBA's survey data for the proposal because of questions about these data, including statistical representativeness given a low survey response rate, lack of information on the statistical methodology used to compute averages, inconsistencies with other reported data by USDA, and other factors. EPA's assessment of the NCBA survey data is contained in EPA's record for the proposed rulemaking. Also, EPA determined that the NCBA survey data, if used, might lead to difficulties in estimating impacts given questions about NCBA's reported high debt-to-asset ratios in the baseline data that appeared inconsistent with other data, including that from USDA. Use of these data would have resulted in most cattle feedlots being assumed as ''baseline closures'' based on the criteria developed for EPA's analysis; these operations would be excluded from analysis since they would be assumed to close in the pre-regulatory baseline.

As part of EPA's public comment period, NCBA has submitted additional financial data and information for cattle feeding operations. This new data submission addresses many of EPA's initial concerns about NCBA's previously submitted survey data by providing additional information about how these data were collected and by including additional diagnostic information that allows EPA to more fully evaluate these survey data. And, based on information provided by NCBA and other commenters, EPA has received additional information indicating that the Agency's initial concerns about NCBA's reported debt-to-asset ratios are largely unfounded (also see discussion in Section V.C.1(c)).

Today EPA presents summary information on alternative financial data for cattle feeding operations provided by NCBA as well as FAPRI and Iowa State University. NCBA provided data developed on the basis of a survey of their members. FAPRI provided enterprise budgets developed by a panel of industry experts. Iowa State University provided information on beef feedlots in Iowa that might be representative of a ''typical'' (roughly 300–500 head) enterprise in Iowa. The data provided by these commenters are summarized briefly below and assessed for their usefulness to EPA's analysis.

NCBA provided the results of a survey of their members. A total of 66 surveys with 1997 financial data, 72 surveys with 1998 data, and 73 surveys with 1999 data were returned by respondents, of which 54, 60, and 58, respectively, were used by NCBA to characterize the finances of the beef feedlots these surveys represent. These data are enterprise level but include information on both company owned cattle and cattle not owned by the feedlot but that are fed on-site (e.g., custom operations). If EPA were to use these data, EPA would consider these representative of both the enterprise and farm since these data are more inclusive of a range of revenue sources. NCBA organized the survey data to present average line items associated with three feedlot size groups (0–10,000 head, 10,001–30,000 head and 30,000+ head). Regional breakouts were not provided. NCBA presented gross receipts, total operating costs, interest payments and receipts, net cash income, depreciation, pretax net income, current assets, total assets, current liabilities, total liabilities, and total equity. NCBA also provided a variety of ratios, including debt-to-assets. These key parameters represent an average over a 3-year period from 1997 to 1999.

FAPRI provided data that might also be used to characterize beef feedlots. For its study, FAPRI convened a panel of experts ''to provide a snapshot of each enterprise at a given point in time.'' These experts developed information on the financial characteristics of each model farm at the enterprise level for 2000. Data submitted are in the form of full financial statements and include other information such as beginning cash reserves, productivity measures, and feed efficiency. The statements represent three sizes and two regions: A 500-head Midwest operation, a 5,000-head Midwest operation, and a 30,000-head Southern Plains operation. Although data are single year, other information provided by FAPRI allow for a more extensive analysis of expected changes over a 10-year period (2001–2011) based on FAPRI's projections that take into account various pricing cycles. FAPRI did not provide corresponding revenue and cost data at the farm level which would allow EPA to appropriately conduct its discounted cash flow analysis at the farm level (see Section V.C.1(b)).

Iowa State University also provided data on average feedlot operations based on actual financial data for feedlots in Iowa. Financial data collected by the university were averaged for 1991–2000 and broken out by type of animal (calf feeder versus yearling feeder).

Table 5–10 shows a summary overview of these alternate data. EPA is considering using these data to characterize financial conditions at beef feedlots and EPA solicits comment on the use of these alternate financial data. EPA is considering using these data in a way that would best match up EPA's estimated representative cost models that are being developed for the final rulemaking (i.e., based on region and facility size characteristics). More detailed information on these data are provided in the record, along with a more thorough assessment and comparison of these data against other available data is provided in the record. This summary also describes publicly available enterprise budget data for this sector that EPA has collected since proposal from various land grant universities. For additional information on how the results of EPA's analysis may change as a result of the use of these alternate enterprise level data, as compared to the farm level data used by EPA for the proposal, see the discussion provided in Section V.C.1(b) of this notice.

TABLE 5–10.—SUMMARY OF ALTERNATE FINANCIAL DATA FOR BEEF FEEDLOTS

State/region date	Sector/assumptions	Revenue	Operating costs	Fixed/overhead costs (incl. depreciation)	Net operating income	Net returns	D–A ratios (In percent)
NCBA 1997–99 [1]	0–10,000 head	$749	$721	$29	$15	($14)	65
NCBA 1997–99 [1]	10,001–30,000 head	853	818	13	26	14	69
NCBA 1997–99 [1]	30,000+ head	1,301	1,267	10	21	10	68
FAPRI 2000	beef 500 head (Midwest)	875	844	33	30	(3)	68

TABLE 5–10.—SUMMARY OF ALTERNATE FINANCIAL DATA FOR BEEF FEEDLOTS—Continued

State/region date	Sector/assumptions	Revenue	Operating costs	Fixed/overhead costs (incl. depreciation)	Net operating income	Net returns	D–A ratios (In percent)
FAPRI 2000	beef 5,000 head (Midwest)	875	850	36	25	(12)	72
FAPRI 2000	beef 30,000 head (Southern Plains).	875	851	35	24	(11)	73
ISU 1991–00	Calves	787	783	NA	NA	5	[2] 39
ISU 1991–00	Yearlings	856	844	NA	NA	12	[2] 39

Sources vary. For more information on the source of these data see EPA's record.
[1] Net operating costs are actually net cash; fixed costs include only depreciation. All values are calculated on a per average occupancy basis, not on a per-marketed head basis.
[2] Average 1997–1999 over all farms.

b. Alternative Financial Data for Hog Operations

For the proposal, EPA used available USDA ARMS data for hog operations to assess financial impacts to this sector. The principal concern among commenters centered around the fact that the data used represented a single year only (1997), a year that happened to be relatively favorable to pork producers. In addition, as recognized by EPA in the proposal, the available 1997 ARMS data used by EPA do not reflect differences in financial conditions associated with differing production and facility types in the hog sector. Specifically, the data are for an average farm and do not distinguish between hog farrow-finish and hog grow-finish operations, as well as independent owner-operator and contract growers. Given potential differences in financial conditions across these types of hog operations and the fact that the prevalence of type varies by factors such as production region and facility size, EPA acknowledged that use of these average data might be problematic in terms of representing specific types of operations within this sector. However, EPA did not have other readily available financial data from which to base its analysis.

Today EPA presents summary information on alternative data provided USDA and FAPRI. EPA is considering use of these data to supplement available data from the 1997 ARMS database used by EPA for the proposal. The USDA data are from a special ARMS survey conducted by USDA in 1998 of the hog sector. FAPRI provided enterprise budgets developed by a panel of industry experts. EPA is considering using these data to characterize financial conditions at hog operations and solicits comment on the use of these alternate financial data. More detailed information on these data are provided in the record, along with a more thorough assessment and comparison of these data against other available data is provided in the record. This summary also describes publicly available enterprise budget data for this sector that EPA has collected since proposal from various land grant universities.

The alternative hog data provided by USDA are based on hog cost and return estimates for 1998 from information collected as part of a special version of USDA's annual ARMS data. The survey obtained more than 1,600 responses from 21 States. The survey target population was farms with 25 or more hogs on the operation at any time during 1998 in order to screen out farms with only a few hogs for on-farm consumption or club project. Each surveyed farm represents a number of similar farms in the population as indicated by its expansion factor. The expansion factor, or survey weight, was determined from the selection probability of each farm and thereby expands the sample to represent the target population. The hog sample expands to represent about 95 percent of the U.S. hog inventory in 1998.

These data have been aggregated by USDA on an enterprise basis and are broken out the four main production groups: Farrow-finish and grow-finish operations, and independent owner-operator and contract grower operations. The main advantage of these data is that they are broken out by production type and reflect varying financial conditions for different types of operations, particularly among contract grower versus independent owner-operators where operating conditions can be very different. However, in order for EPA to properly utilize these data, the Agency needs information on the number of operations nationwide and/or regionally within each of these four production groups. Specifically, EPA does not have information needed in order to estimate the number of contract grower operations in the hog sector. As part of this notice, EPA requests additional data and information on the number of operations within each of these four production hog groups for use in EPA's final analysis of this sector.

These alternative hog data from USDA represent financial conditions for all operations nationwide and do not differentiate by the production region. The data are, however, differentiated by two major size groups, including operations with more than 1,000 AU and operations with between 300 and 1,000 AU. Among the key parameters provided in USDA's aggregation include gross receipts, total operating costs, net cash income, depreciation, pretax net farm income (the latter are measured as USDA's definitions of net farm income, which includes depreciation and nonmoney expenses and, for these data, exclude off-farm income). Data provided to EPA do not include full income statement and balance sheets for representative facilities, which would allow EPA to evaluate other financial variables. The data also include and total assets and liabilities specified at the farm level only, and not the enterprise level. These alternative USDA data do not include information on beginning cash reserves. The data represent financial conditions for a single year (1998) only. All data are expressed on a per animal (inventory) basis.

This initial submission by USDA does not include corresponding data at the farm level. At this time, USDA is considering whether it is possible to provide these data on a farm level basis in order for EPA to conduct its discounted cash flow analysis (which is more appropriately evaluated at the farm level, as discussed in Section V.C.1(d)). If alternative data are not provided at the farm level, EPA will continue to use available 1997 ARMS farm level data used by EPA for the proposal. An alternative approach would be to use available published ARMS farm level data for farrow-finish and grow-finish operations that are expressed on a per animal

(hundredweight gain) basis, adjusted by EPA onto a per animal (inventory) basis. USDA published farm level data is available at http://www.ers.usda.gov/data/arms/Results99/drctab.htm.

FAPRI also provided data that might be used to characterize hog operations. FAPRI provided enterprise budgets that reflect farrow-finish operations in the Midwest and Mid-Atlantic regions. No considerations have been made for differences between contractor and independent operations. For its study, FAPRI convened a panel of experts ''to provide a snapshot of each enterprise at a given point in time.'' These data reflect information on the financial characteristics of each model farm at the enterprise level for 2000. Although data are single year, other information provided by FAPRI allow for a more extensive analysis of expected changes over a 10-year period (2001–2011) based on FAPRI's projections that takes into account various pricing cycles. Data submitted are in the form of full financial statements and include other information such as beginning cash reserves, productivity measures, and feed efficiency. FAPRI did not provide corresponding revenue and cost data at the farm level which would allow EPA to appropriately conduct its discounted cash flow analysis at the farm level (see Section V.C.1(b)).

Table 5–11 shows a summary overview of these alternate data. EPA is considering using these data to characterize financial conditions at hog operations and EPA solicits comment on the use of these alternate financial data. EPA is considering using these data in a way that would best match up EPA's estimated representative cost models that are being developed for the final rulemaking (i.e., based on region and facility size characteristics). More detailed information on these data are provided in the record, along with a more thorough assessment and comparison of these data against other available data is provided in the record. This summary also describes publicly available enterprise budget data for this sector that EPA has collected since proposal from various land grant universities. For additional information on how the results of EPA's analysis may change as a result of the use of these alternate enterprise level data, as compared to the farm level data used by EPA for the proposal, see the discussion provided in Section V.C.1(b) of this notice.

TABLE 5–11.—SUMMARY OF ALTERNATE FINANCIAL DATA FOR HOG OPERATIONS

State/region date	Sector/assumptions	Revenue	Operating costs	Fixed/overhead costs (incl. depreciation)	Net operating income	Net returns	D–A ratios
FAPRI 2000	Hogs 2,400 sows (Midwest).	$46	$37	$6	$9	$3	66
FAPRI 2000	Hogs 2,400 sows (Mid-Atlantic).	46	37	6	8	2	67
FAPRI 2000	Hogs 150 sows (Midwest)	46	39	5	7	3	56
FAPRI 2000	Hogs 500 sow (Midwest)	46	37	7	9	4	60
FAPRI 2000	Hogs 500 sow (Mid-Atlantic).	46	37	6	8	460	
FAPRI 2000	Hogs (Pacific)	46	38	5	8	2	56
USDA 1998	Hog contract GF 300–1,000 head.	92	88	32	5	(27)	25
USDA 1998	Hog contract GF 1,000 head.	92	87	17	8	(19)	36
USDA 1998	Hog indep. FF 300–1,000 head.	71	67	61	4	(57)	20
USDA 1998	Hog indep. FF 1,000 head	80	61	38	19	(19)	24
USDA 1998	Hog indep. GF 300–1,000 head.	80	86	39	(6)	(45)	23
USDA 1998	Hog indep. GF 1,000 head	100	95	27	5	(21)	42

Sources vary. For more information on the source of these data see EPA's record.

c. Alternative Financial Data for Dairy and Broiler Operations

For some other sectors where enterprise data are not available or have not been submitted—including the dairy, heifer and poultry sectors—EPA is considering use of available enterprise budget data for these sectors to supplement available data from the 1997 ARMS database used in the proposal. Today EPA solicits comment on these data and requests information on any additional sources of similar or alternate data for the key livestock sectors. At this time, EPA has not received or obtained any enterprise level data for the turkey and egg laying sectors. As part of this notice, EPA is requesting any available data for these two sectors. As part of this notice, EPA requests similar enterprise budget information for the turkey and egg laying sectors.

Since the publication of the proposed CAFO regulations, EPA has collected published ''enterprise budget'' data from various land grant university sources in order to further evaluate the availability of usable enterprise level data and information. Enterprise budgets show some ''typical'' operations able to cover their variable expenses, and in many cases to cover fixed expenses and provide the operator with some return. However, many budgets indicate that—as a stand-alone operation—the enterprise would not generate positive operating earnings (that is, the operator is unable to cover operating expenses). This may be explained by savings due to shared production costs among multiple enterprises at a farm or due to integrated production practices (such as the use of one enterprise, e.g., grain crops, as an input to another, e.g., livestock operation), as well as support through government subsidies.

As part of this effort, EPA has compiled enterprise budgets for beef feedlots (14 budgets), farrow-finish hog operations (10 budgets), grow-finish hog operations (5 budgets), dairy operations (7 budgets), heifer operations (4 budgets), and broiler operations (3 budgets). The range of sources included University of Idaho, Ohio State University, Oklahoma State University,

Kansas State University, North Carolina State University, Ohio State University, Clemson University, and University of Arkansas. The enterprise budgets span a wide range of assumptions, including size and type of operation, the type, age, or sex of animal raised, and also feed and operating efficiency. The budgets varied greatly with respect to line items, which items were considered variable or fixed, whether depreciation and interest were reported separately, or whether a capital recovery item or building and equipment charge was reported. The year for which data in these budgets represents varies, tending to be within the period from 1997 to 2000, with some exceptions. More detailed information on these enterprise budgets are provided in the record, along with a more thorough assessment and comparison of these data against other available data is provided in the record.

For the dairy sector, among the sources of alternative financial data that EPA is considering to supplement available data used for the proposal is available enterprise budget data for dairy and heifer operations compiled by EPA. A second source of alternative data for dairy operations is from FAPRI, submitted to EPA as part of FAPRI's analysis of this sector. These data consist of expert panel data for six representative operations at the enterprise level, and are similar in format to those described for beef feedlots and hog operations in Sections V.C.2(a) and (b). A third source of alternate data for diaries is USDA, who is intending to submit alternate financial data for 2000 from information collected as part of a special version of USDA's annual ARMS data. This survey consist of information obtained from about 900 responses from dairy producers in 22 States. If these alternative ARMS data are provided to EPA, they will reflect enterprise and/or farm level financial conditions similar to that provided by USDA for the hog sector (as described in Section V.C.2(b)). Since data will only be provided for a single year only (2000), EPA is considering ways to derive these data onto a more representative basis by linking these single year data up with other market and financial data for multiple years (as discussed in Section V.C.2(e)). Table 5–11 shows a summary overview of each of these alternate data. EPA is considering using these data to characterize financial conditions at dairy operations and would use these data in a way that would best match up EPA's estimated representative cost models that are being developed for the final rulemaking (i.e., based on region and facility size characteristics). More detailed information on these data are provided in the record. For additional information on how the results of EPA's analysis may change as a result of the use of these alternate enterprise level data, as compared to the farm level data used by EPA for the proposal, see the discussion provided in Section V.C.1(b) of this notice.

For the broiler sector, EPA has collected enterprise budgets that it is considering to use as a supplement to available 1997 ARMS data used by EPA for the proposal. For this sector, three representative broiler operations are available from the University of Arkansas (2000 data), Oklahoma State University (1997 data), and North Carolina State University (1993 data). Table 5–12 shows a summary overview of these alternate enterprise budget data. Given limited financial data at the enterprise level for broiler operations, EPA is considering using these data as a supplement to the 1997 ARMS data used for the proposal for this sector. EPA solicits comment on the use of these alternate financial data. More detailed information on these data is provided in the record.

TABLE 5–12.—SUMMARY OF ALTERNATE FINANCIAL DATA FOR DAIRY, HEIFER AND BROILER OPERATIONS

State/region date	Sector/assumptions	Revenues	Operating costs	Fixed/overhead costs (incl. depreciation)	Net operating income	Net returns	D–A ratios
KS 2000	600 lactating cows, 19,000 lbs./cow.	$2491	$2739	$321	($248)	($569)	NA
KS 2000	600 lactating cows, 24,000 lbs/cow.	3085	2956	321	129	(192)	NA
KS 2000	2,400 lactating cows, 19,000 lbs/cow.	2539	2621	287	(82)	(369)	NA
KS 2000	2,400 lactating cows, 24,000 lbs/cow.	3145	2838	287	307	20	NA
ID 1998	Jerseys, 120 cows, 15,000 lb/cow.	2452	1830	359	622	263	NA
ID 1998	Holsteins, 210 cows, 20,000 lbs/cow.	2775	2258	224	518	294	NA
ID 1998	Holsteins, 210 cows, 22,000 lbs/cow.	3026	2365	350	660	310	NA
FAPRI 2000	250-cow (Mid-Atlantic)	3115	2605	292	510	218	0.41
FAPRI 2000	500-cow (Mid-Atlantic)	3115	2474	291	641	350	0.41
FAPRI 2000	1,000-cow (Southern)	3168	2527	288	641	352	0.45
FAPRI 2000	250-cow (Midwest)	3094	2584	292	510	218	0.41
FAPRI 2000	500-cow (Central)	3072	2510	291	562	271	0.46
FAPRI 2000	1,000-cow (Pacific)	3254	2533	288	721	432	0.40
OH 1999	Small Breed Heifer	1150	1154	123	(4)	[1] (127)	NA
OH 1999	Large Breed Heifer	1200	1381	123	(181)	[1] (304)	NA
ID 1998	Holstein, 210 head heifer	1268	1053	117	215	98	NA
ID 1998	Jersey, 127 head heifer	942	754	141	189	48	NA
OK 1997	134,300 birds sold per year.	0.275	0.090	0.088	0.184	[1] 0.096	NA
NC 1993	105,320 birds sold per year.	0.255	0.077	0.077	0.178	0.102	NA
AR 2000	313,500 birds sold per year.	0.298	0.098	0.159	0.200	0.041	NA

Sources vary. For more information on the source of these data see EPA's record.

[1] Property taxes and interest not included or not broken out in this budget.

d. Alternative Data To Supplement Available Financial Data for a Single Year

For the proposal, EPA used available USDA's ARMS data for each of the livestock and poultry operations affected by the proposed regulations to assess financial impacts to these sectors under post-compliance scenarios. The available data for these sectors was 1997. Although data were only available for a single year, for most sectors, financial data for 1997 was fairly representative of average market conditions in recent years. For some sectors, such as for the hog sector, the available 1997 data was less representative of average conditions in recent years since 1997 happened to relatively favorable to pork producers. By comparison market conditions for the hog sector were particularly poor for this sector during 1998–1999, given large decreases in producer prices. These concerns about the use of 1997 ARMS data to assess facility impacts in the hog sector was acknowledged by EPA to be problematic; however, EPA did not have additional alternate financial data from which to base its analysis.

As discussed in earlier in Section V.C.2, EPA has received alternate data for some sectors, including hog and cattle feeding operations, that it is considering using for its analysis, if convinced of the superiority of that data to the data used for the proposal. To address concerns about the use of a single year of data for the purposes of EPA's analysis, the Agency is considering an approach to link up available financial data to other market and financial data for preceding and subsequent years. The type of data that may be used for this purpose would include, but not be limited to, commodity price and income information to represent changes for a representative facility's revenue, as well as feed costs or corn and/or soybean prices to represent changes for a representative facility's operating costs. This approach would provide an attempt to level out financial conditions over a three- or five-year period to derive data that are more representative of average conditions within a particular sector—for example, providing better characterization of year-to-year changes and pricing cycles—and avoid potential misrepresentation due to use of a single year of available data.

An example of how this approach would be utilized for the purpose of this analysis is as follows using available financial data for the hog sector. This sector is used for this example because financial data used by EPA for the proposal as well as alternate data being considered for EPA's final analysis may be regarded as less than representative or average conditions, since 1997 ARMS data reflect conditions when hog prices were relatively high and 1998 ARMS data reflect conditions when hog prices were relatively low. Because of concerns about misrepresentation, EPA is considering ways to derive more average, representative data across a few years (say, 1997–1999) based on an extrapolation from other available market and financial data to represent a longer-term average representation of revenues, costs and returns.

There are two possible approaches that EPA is considering. The first approach involves using price indices representing hog prices and feed prices, as well as cost indices representing other cost of production factors (Commodities, Services, Interest, Taxes, and Farm Wage Rates). The second approach that EPA is considering would use USDA estimates of hogs costs and returns, which are from the same ARMS survey, to establish a set of indices based on these data. Using available financial data for 1998, on an enterprise specific basis, these indices can be applied to approximate financial returns for other years (e.g., 1996–2000). Given potential data limitations and unforseen difficulties in adopting such an approach, the only other alternative would be to use a single year of data since publicly available data is not available to characterize these sectors over a multiple year period. EPA solicits comment on the preferred approach that the Agency should use—either single year or EPA-derived multiple year data based on available data and information.

e. Alternative Data To Project Out Financial Data Over the 10-Year Analysis Period

For the proposal, EPA projected future earnings from the 1997 ARMS baseline data based on USDA's *Agricultural Baseline Projections to 2009.* USDA projections are expressed on a per-unit basis (*i.e.,* cash returns per animal or per-unit output). These projected values were linked to USDA's 1997 ARMS data by first translating the USDA-projected changes onto a per-animal basis, using available market information, such as average per-animal yields reported by USDA and/or annual marketing cycles based on industry data. Once USDA's projections were expressed on a per-animal basis, future earnings are approximated by applying the incremental national average change (dollars per animal) between each year during the forecast period to the 1997 baseline data for each representative model CAFO. These revised cash streams over the forecast period are presented in EPA's Economic Analysis.

Many commenters express concerns about EPA's use of the USDA's forecasts, primarily because they fail to account for variability of returns year-to-year. Commenters point out that the methods used by USDA to derive these forecasts do not account for supply and demand shocks in the baseline that may dampen pricing cycles common in many of these sectors. Since USDA's price forecasts may not account for the real and emerging price risks faced by producers from exogenous and random shocks, this may understate financial stress with respect to cash flow over the forecast period. Also, according to commenters, the USDA forecasts and methods fail to capture dynamic, secondary effects of interspecies shifts, and the dynamic interaction between an individual operation's year-to-year financial performance and the overall change in supply and demand for the entire meat industry.

To address this concern EPA is considering using other available timeline data by FAPRI that accounts for these types of price shocks in order to develop its long-term agricultural baseline estimates. These data are available for review in FAPRI's ''2001 U.S. Baseline Briefing Book'' available at FAPRI's website. These data may also be used in conjunction with other baseline results generated by FAPRI's model, including upcoming updates to FAPRI's baseline as well as additional work conducted by FAPRI in connection with its review of EPA's proposed CAFO regulation (*see,* ''FAPRI's Analysis of the EPA's Proposed CAFO Regulation'' and also ''Financial Impact of Proposed CAFO Regulations on Representative Broiler Farms''). These reports are provided in EPA's record and are also available at FAPRI's website at: http://www.fapri.missouri.edu/FAPRI_Publications.htm.

EPA solicits comment on the use of these data for depicting expected price changes over EPA's 10-year analysis period (1997–2006). A potential necessary adjustment that EPA may need to make prior to using FAPRI's data is to remove the effects of inflation in these values by backing out the

assumed inflationary rates. This is consistent with EPA's longstanding practice whereby only the effects of a new regulatory action is evaluated without the effects of inflation. This approach is also consistent with OMB and EPA guidance. EPA solicits comment on this approach for the purposes of using FAPRI's data for its analysis.

VI. Changes to EPA's Environmental Assessment

EPA received comments on the methodologies and data used to estimate CAFO pollutant loadings and air emissions associated with the proposed regulatory options, as well as data and methodologies used to perform surface water modeling and to evaluate the presence of pathogens, antibiotics, and hormones in CAFO wastes. Some commenters provided EPA with alternative suggestions for these analyses and estimates. Today's notice presents the suggestions currently under consideration by EPA for use in the environmental assessment.

A. Estimates of ''Edge-of-Field'' Pollutant Loadings

For proposal, EPA modeled ''edge-of-field'' pollutant releases (or ''loadings'') from the application of manure, manure storage structures, and feedlots. The loadings were estimated for several sample farms for baseline conditions and each proposed regulatory option. The Groundwater Loading Effects of Agricultural Management Systems (GLEAMS) model was used to estimate the loadings from land application areas receiving manure and/or commercial fertilizer.

GLEAMS is a field-scale model that simulates hydrologic transport, erosion, and biochemical processes such as chemical transformation and plant uptake. The model uses information on soil characteristics and climate, along with characteristics of the applied manure and commercial fertilizer, to model losses of nutrients, metals, pathogens, and sediment in surface runoff, sediment, and ground water leachate. EPA solicited input from USDA to refine the loadings analysis using the GLEAMS model. Based on these discussions, EPA is considering increasing the number of sample farms to better characterize runoff from CAFOs, in particular to better account for varying climate and soils and to incorporate revised data on crop rotations and nutrient uptake.

More specifically, at proposal, EPA modeled five sample farms for each animal type representing various regions of the country (Central, Mid-Atlantic, Midwest, Pacific, and South). EPA is now considering defining additional sample farms by sector, size, and land availability class using USDA data from the *1997 Census of Agriculture,* as well as the *1997 National Resources Inventory.* This methodology is consistent with the original proposal. Alternatively, EPA may use data derived from USDA's published reports, such as ''Confined Animal Production and Manure Nutrients'', the draft report ''Profile of Farms with Livestock in the United States: A Statistical Summary'', and ''Confined Animal Manure Nutrient Data System,'' for additional sample farm development. These aggregated data modeled from the *1997 Census of Agriculture* and the *1997 National Resources Inventory*, are available in the record. This aggregated state level data provides farm counts, manure application rates based on crop nutrient requirements, and total acres by crop type. EPA would use this aggregated data to develop additional sample farms, representing different farm sizes and soil types. EPA would then disaggregate results from GLEAMS to estimate loadings by size of operation, animal sector, and land availability class based on the distribution of collectible manure described in USDA's report ''Manure Nutrients Relative to the Capacity of Cropland and Pastureland to Assimilate Nutrients'', and subsequent reports.

Improved characterization of cropping rotations and potential nutrient uptake on sample farms may be developed from the *1997 Census of Agriculture* and the *1997 National Resources Inventory*. EPA is also considering increasing the number of soils modeled for each sample farm from one to three to better represent the diversity of soil types at CAFOs. Data summaries from the *1997 Census of Agriculture* and the *1997 National Resources Inventory* are available in the record.

EPA recognizes the potential for subsurface drainage effects on ''edge-of-field'' loadings but data are currently inadequate to model these effects. EPA also recognizes that improved animal genetics and feeding strategies may alter manure nutrient characteristics. Due to a lack of new data and the difficulties of characterizing those changes, EPA anticipates continuing to use manure characteristics used in the original model analysis unless sufficient alternative data become available.

EPA is continuing to evaluate the use of the Better Assessment Science Integrating Point and Nonpoint Sources (BASINS) model (described in Section VI.B) to provide additional information for modeling pathogen loads, loads from the production area, and manure storage lagoon effects.

B. Surface Water Modeling

For proposal, EPA used the estimates of pollutant loadings and a distribution of AFOs and CAFOs in the National Water Pollution Control Assessment Model (NWPCAM) to develop estimates of changes in surface water quality. Based on new data and suggested methodologies, EPA is evaluating whether the Better Assessment Science Integrating Point and Nonpoint Sources (BASINS) model can be used to provide additional analysis of surface water impacts.

The BASINS model supports the analysis of point and nonpoint source management alternatives and can support the analysis of a variety of pollutants at multiple scales. BASINS contains five categories of components: (1) National databases; (2) assessment tools for evaluating water quality and point source loadings at a variety of scales; (3) utilities including local data import, land-use and DEM reclassification, watershed delineation, and management of water quality observation data; (4) watershed and water quality models; and (5) post processing output tools for interpreting model results.

BASINS includes integration of the Soil and Water Assessment Tool (SWAT) model, developed by the USDA's Agricultural Research Service (ARS). SWAT is a watershed-scale model developed to predict the impact of land management practices on water, sediment, and agricultural chemical yields in large complex watersheds with varying soils, land use, and management conditions over long periods of time.

Using BASINS, EPA developed a case study to model environmental impacts and potential improvements associated with the proposed regulations. EPA modeled the Middle Neuse River (HUC# 03020202) in North Carolina for swine farms. The input data sets used include: (1) Farm locations; (2) crop types, cropping dates, and crop rotation from the December 1997 USDA report entitled ''Usual Planting and Harvesting Dates for U.S. Field Crops''; (3) 100-year weather data; (4) manure application rates and timing; and (5) frequency of manure storage type. As part of the case study, EPA estimated baseline loadings to surface waters at specific locations using a yearly average of a 100-year run for nitrogen, phosphorus, sediment, and metals; where feasible, baseline loadings for pathogens, hormones, and antibiotics were also estimated. Relative changes in water quality as a result of

pollutant load changes were assessed for nitrogen, phosphorus, sediment, and metals, and, where feasible, for pathogens, hormones, and antibiotics. EPA is considering expanding this case study method to the dairy, beef, broiler, turkey, and layer sectors. EPA solicits comments on this approach. This case study is available in the record for today's notice.

C. Pathogens, Antibiotics, and Hormones

During the comment period, EPA received new data on the presence of pathogens, antibiotics, or hormones in fresh animal manure, storage lagoons, ground water, and surface water. For example, a review of literature by Mulla et al. (1999) found there were no significant differences in fecal bacteria levels in surface runoff from manured versus unmanured or grazed versus ungrazed lands. Furthermore, rate, method, or timing (spring versus fall) of manure application had little effect on fecal bacteria counts in surface runoff. Much of the new data received by EPA pertains to antibiotic resistance. EPA is considering ways to incorporate these new data into its analyses. These new data are available in the record.

EPA also received data on the effectiveness of certain treatment technologies in reducing the level of pathogens in animal waste and associated effluents. These technologies include anaerobic lagoons, aerobic lagoons, digesters, constructed wetlands, overland flow, solids separation, and alkaline treatment. Many of these technologies have the potential to achieve substantial pathogen reductions, depending on their mode of operation, but several factors may greatly impact the efficiency of these technologies. Most of these technologies are time dependant (some requiring months of residence time) and pathogen reduction may be lower with reduced residence time. Continuous addition of manure also reduces the efficiency of pathogen removal or destruction for some technologies. Other technologies operate best when treating waste with specific solids content (e.g., constructed wetlands and composting), or when operating under specific temperature ranges (e.g., anaerobic thermophilic digesters, constructed wetlands, and thermal processes). EPA is considering ways to incorporate these new data into its analyses. These new data are available in the record.

D. CAFO Air Emissions

Based on additional data and comments received, EPA is considering revising some of the methodologies for estimating air emissions from CAFOs, as well as the quantification of benefits associated with reduced air emissions. EPA solicits comment on these potential revisions, which are discussed below.

1. Estimating Air Emissions from CAFOs

Since proposal, EPA has continued to gather additional data on the type and quantity of air emissions from CAFOs (''Air Emissions from Animal Feeding Operations'', Draft, available in the record). EPA has requested the National Academy of Science (NAS) review the scientific issues and make recommendations related to characterizing the swine, beef, dairy, and poultry AFO industry; measuring and estimating emissions; and analyzing potential best management practices, including costs and technological feasibility. The NAS review is expected to focus on emissions of PM10, PM2.5, hydrogen sulfide, ammonia, odor, VOC, methane, and nitrous oxide. NAS will recommend approaches for characterizing emission profiles and identifying emission mitigation techniques, including: (1) The use of process characterization at model farms to estimate emissions from individual farms, (2) modeling approaches for estimating emissions, (3) monitoring or measurement methods of emissions, (4) modeling approaches for determining off-site impacts, (5) modeling approaches for determining ammonia deposition patterns, (6) emission mitigation technologies and management practices, including capital and operating costs, and methods for validating the effectiveness once installed, and (7) critical research needs with appropriate methodological approaches.

EPA has evaluated the new data presented today to determine whether changes in air emission methodologies are warranted for the non-water quality impacts assessment. Based on these data, EPA has identified three areas for possible revision: alternative emission factors, revised methane methodology for anaerobic lagoons, and revised boundary conditions. Today's record includes a memorandum discussing these potential changes.

a. Revised Emission Factors

EPA has identified the following revisions to emission factors for certain pollutants or animal operations based on values found in the peer reviewed literature: (1) More recent emission factors for transportation emissions of VOC, NO_X, CO, and PM are available from the Mobile 6 model, maintained by the Office of Transportation and Air Quality, (2) additional emission factors for ammonia and hydrogen sulfide emissions from swine deep pit operations, (3) additional emission factors for ammonia emissions from dairy drylots, broiler and turkey cake and litter storage, and land application, (4) an emission factor for hydrogen sulfide emissions from land application of swine manure, and (5) a correction to the emission factor used for nitrous oxide emissions from poultry housing without bedding.

In addition, for proposal, the emission rates for ammonia and hydrogen sulfide from lagoons and ponds were dependent on the size of the impoundment. EPA used this approach to reflect expected increases in emissions that would occur with Option 7, which required larger storage lagoons and ponds. However, EPA now believes the available flux factors may significantly overestimate the increased emissions. Therefore, EPA is considering revising this methodology to use emission factors that do not vary based on the size of the lagoon or pond.

b. Revised Methane Methodology for Anaerobic Lagoons

For proposal, estimates of methane emissions were based on guidance developed for international reporting of greenhouse gas emissions (IPCC 2000) and used by EPA to develop the annual inventory of greenhouse gas emissions. The basic methodology, which bases methane emissions on the mass of volatile solids excreted, the maximum methane production potential per unit mass of volatile solids excreted (which is animal-type specific), and a management-specific methane conversion factor (MCF), has not changed. Since November 2000, EPA refined the methodology to calculate MCFs for anaerobic lagoon systems to better account for long-term storage of manure in these systems.

At proposal, anaerobic lagoon MCFs were calculated using the Van't Hoff-Arrhenius equation and annual average regional temperatures to estimate the effect of temperature on volatile solids degradation and methane generation under anaerobic conditions. The MCFs were then adjusted using a factor of 1.35 for regions with annual average temperatures exceeding 20°C and a factor of 1.75 for regions with annual average temperatures below 20°C. These factors accounted for the relatively long hydraulic and solids retention times associated with these systems, which allows organic matter to break down over time. EPA has, since proposal, refined this methodology to specifically calculate the monthly generation of

methane and the expected retention of volatile solids in the lagoon from month to month. The refined methodology is documented in the ''Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–1999'' (EPA 236–R–01–001, April 2001).

c. Revision of Boundary Conditions

At proposal, EPA estimated non-water quality impacts for changes in air emissions that occurred only at the feedlot's production and land application areas, as well as those transportation-related emissions from hauling manure off site. EPA did not include changes in emissions occurring at the off-site land application area. For example, EPA estimated the loss of nitrogen as ammonia when manure is applied to cropland at the CAFO; however, EPA did not include similar ammonia emissions that occur when CAFO-generated manure is land applied off site. EPA is considering expanding the non-water quality impacts to include off-site releases associated with land application.

2. Quantifying the Benefits of Reduced Air Emissions

At proposal, EPA presented a qualitative discussion of the health and environmental impacts of air emissions from CAFOs in the Environmental Assessment for the proposed rulemaking. EPA also quantified certain air emissions as part of the non-water quality analysis of the proposal, but did not quantify or monetize any of the human health or ecological benefits from any changes in air emissions attributable to the proposed rule. In the analysis for the proposed rule, EPA quantified changes in emissions for methane, carbon dioxide, nitrogen oxides, volatile organic compounds, particulate matter (PM), and carbon monoxide. EPA is now considering the feasibility of developing quantified and monetized estimates of the benefits of changes in health effects resulting from changes in air emissions from CAFOs, if data are available.

PM represents a broad class of chemically and physically diverse substances. It can be principally characterized as discrete particles that exist in the condensed (liquid or solid) phase spanning several orders of magnitude in size. All particles equal to and less than 10 microns are called PM10. Fine particles can be generally defined as those particles with a diameter of 2.5 microns or less (also known as PM2.5). The health and environmental effects of PM are strongly related to the size of the particles; fine particles are considered to be more harmful to human health because their small size enables them to penetrate more deeply into the lungs.

Particulate matter has been linked to a range of serious respiratory health problems. Scientific studies suggest ambient particulate matter likely contributes to a series of health effects. The key health effects categories associated with ambient particulate matter include premature mortality; aggravation of respiratory and cardiovascular disease (as indicated by increased hospital admissions and emergency room visits, school absences, work loss days, and restricted activity days); aggravated asthma; acute respiratory symptoms, including aggravated coughing and difficult or painful breathing; chronic bronchitis; and decreased lung function that can be experienced as shortness of breath. PM also causes damage to materials, soiling of commonly used building materials and culturally important items such as statues and works of art, and is a major cause of substantial visibility impairment in many parts of the U.S.

Livestock production is one of the major sources of air emissions of ammonia which, in turn, leads to PM production when the ammonia volatilizes. Volatilized ammonia can contribute to the formation of both ammonium sulfate and ammonium nitrate, which are two of the main components of fine PM. In some areas of the country, ammonia is believed to be the limiting factor in the formation of ammonium sulfate and ammonium nitrate. In these areas, reductions in ammonia emissions would result in reductions of both ammonium sulfate and ammonium nitrate, with a possible corresponding reduction in fine PM and the associated adverse health effects. Increases in ammonia emissions could, in turn, result in increased adverse health effects. The atmospheric reactions involving PM fine formation are very complex and the changes in health effects would be highly dependent on the formation of other particles in the absence of ammonia, some of which could be more hazardous. Modeling these changes is highly dependent on the accuracy of ammonia emission estimates.

Additional detail and background on this process is contained in the record for today's notice. EPA solicits comment generally on the feasibility of these approaches and requests information on data and studies not included in the record that could be used for these analyses.

VII. New Information Related to the Proposed NPDES Regulations

A. Ducks and Horses

Following publication of the proposed rulemaking, EPA received additional information that is leading the Agency to consider other size thresholds for determining whether duck and horse operations are CAFOs and subject to NPDES permitting. Specifically, EPA is considering two alternative thresholds for ''dry lot'' duck operations. EPA is also presenting for consideration two options for revising the horse threshold that could be used in whatever approach is adopted in the final rulemaking, whether two-tier or three-tier.

The preamble to the proposed rulemaking discusses the relevance of the proposed regulation for the duck, horse and sheep sectors. While the effluent guideline for these sectors is not being revised, the changes to the NPDES regulation would affect them. Operations that are defined as CAFOs that have greater than 1,000 AU would continue to be subject to the existing effluent guidelines and standards (as they are in the existing regulation), while those with 1,000 AU or fewer would be issued permits with technology-based requirements determined by the permit writer based on best professional judgment.

As discussed in the proposed rulemaking, EPA limited its economic analysis to those animal types that produce the greatest amount of manure and wastewater in the aggregate while in confinement and, therefore, did not analyze the horse, sheep/lamb or duck sectors. EPA stated its belief that most horse and sheep/lamb operations are not confined and, therefore, are not subject to permitting; thus, the impacts in these sectors are expected to be minimal. Most duck operations, on the other hand, probably are confined. EPA requested comment on the effect of the proposed regulation on the horse, sheep/lamb, and duck sectors.

EPA used the size thresholds under the existing regulation as a basis for adjustments to be consistent with the general restructuring of the NPDES regulation. Consequently, the size of operations under the different threshold options of the co-proposed two-tier and three-tier alternatives would have been as depicted in Table 7–1.

TABLE 7–1.—SIZE OF OPERATIONS UNDER DIFFERENT THRESHOLD OPTIONS

Sector	1,000 AU	500 AU	300 AU
Ducks	5,000	2,500	1,500
Horses	500	250	150
Sheep/Lambs	10,000	5,000	3,000

Once defined as CAFOs, operations in these sectors would be affected by all the other general changes that were proposed, such as elimination of the 25-year, 24-hour storm permit exemption; the duty to apply for an NPDES permit; land application and Permit Nutrient Plan requirements; and other miscellaneous permit conditions described in the proposed rulemaking.

The horse and duck communities raised a variety of concerns with the proposed regulation. Both sets of commenters specifically questioned the reasonableness of the original threshold values that were used to realign these sectors under the new structure.

As described in the proposed rulemaking (66 FR 3013, January 12, 2001), the legislative history indicates that the threshold numbers initially established by the Agency were based generally on a statement by Senator Muskie when the Clean Water Act was enacted. Senator Muskie, floor manager of the legislation, stated that: ''Guidance with respect to the identification of 'point sources' and 'nonpoint sources,' especially with respect to agriculture, will be provided in regulations and guidelines of the Administrator.'' 2 Legislative History of the Water Pollution Control Act Amendments of 1972 at 1299, 93d Cong, 1st Sess. (January 1973). Senator Muskie then identified the existing policy with respect to identification of agricultural point sources as generally that ''runoff from confined livestock and poultry operations are not considered a ''point source'' unless the following concentrations of animals are exceeded: 1000 beef cattle; 700 dairy cows; 290,000 broiler chickens; 180,000 laying hens; 55,000 turkeys; 4,500 slaughter hogs; 35,000 feeder pigs; 12,000 sheep or lambs; 145,000 ducks.'' *Id.* In the original CAFO regulations, the Agency and commenters agreed that, while Senator Muskie's statement provided useful general guidance, particularly in support of the idea of defining CAFOs based on specified numbers of animals present, it was not a definitive statement of the criteria for defining a CAFO. 41 FR 11458 (Mar. 18, 1976). The Agency thus looked to data with respect to the amount of manure generated by facilities above the threshold, the operating characteristics in each sector, and the number of facilities potentially covered by the regulation.

1. Ducks

EPA is considering retaining the size thresholds contained in the existing regulation for ''wet lot'' duck operations, but is considering two alternative methods for establishing new, separate threshold equivalents for ''dry lot'' duck operations.

TABLE 7–2.—ALTERNATIVE THRESHOLDS FOR DUCK OPERATIONS

	1,000 AU number of ducks	500 AU number of ducks	300 AU number of ducks
Proposed Rule: All Confined Ducks	5,000	2,500	1,500
NODA Option: Wet Lot Systems	5,000	5,000	1,500
NODA Options: Dry Lot Systems—NODA Option A	30,000	15,000	10,000
NODA Option B	100,000	50,000	30,000

The Technical Development Document for the 1974 effluent guideline indicates that there were 13 million ducks raised in 1969, primarily in New York, Indiana, Wisconsin, California and Illinois. At that time wet lots comprised 80 percent of duck operations, predominantly in the eastern U.S., and 45 percent of all ducks were raised on eastern Long Island, New York. Ninety-five percent of ducks were market ducks, and five percent were breeder ducks.

In its analyses for the original rulemaking in 1974, EPA initially evaluated two subcategories for ducks: wet lots and dry lots. Wet lots have sloped edges leading to a swimming area; dry lots are buildings usually with flushing troughs placed under the wire floor. EPA's selection of the 5,000 head threshold for ducks was based largely on the predominance of wet lot systems and the birds' direct contact with water. The effluent guideline applies to both wet lot and dry lot operations.

Information provided by commenters on the demographics of duck operations and the characteristics of duck manure and wastewater argues for reevaluating the number of ''dry lot'' ducks that would meet the thresholds for being defined as CAFOs under either a two-tier or three-tier structure. EPA notes that using the existing threshold under either structure would cause most duck operations to be subject to NPDES regulation.

Today, almost all duck operations are dry lot operations. Commenters provided information to the Agency that indicates that most duck operations now use confinement methods that are similar to those used in the chicken sector, where the animals do not come into contact with water. Therefore, they suggest, the thresholds should be similar to those EPA is considering for poultry (30,000 birds, 50,000 birds, and 100,000 birds, respectively, for the 300 AU, 500 AU and 1,000 AU equivalents). Other commenters suggest setting a threshold (rounded off by EPA) of 10,000 birds (300 AU), 15,000 birds (500 AU) or 30,000 birds (1,000 AU). The latter threshold values would represent a more moderate change from the regulatory threshold of 5,000 ducks, and would take into account the larger quantity of manure that ducks generate compared to chickens. EPA is considering whether to adopt either of these suggested thresholds.

Concomitant with selecting either of these alternatives for dry lot duck operations in the final rulemaking, EPA is considering retaining the existing threshold of 5,000 ducks for wet lot operations. Very few duck operations in

the U.S. use wet lots, and may not warrant increased regulation by lowering the threshold to, say, 2,500 ducks should a two-tier structure at 500 AU be selected. By retaining the current thresholds, operations covered under the existing regulation would remain subject to the revised regulation, but an unnecessary expansion to smaller operations would be avoided.

According to the 1997 Agricultural Census (United States Department of Agriculture, National Agricultural Statistics Service, 1997 Census of Agriculture) there are 30,452 farms with ducks and 8,918 farms with duck sales. Information provided by the duck industry indicates that approximately 24 million ducks are produced in the United States by approximately 7 processors as of 2001. Three-fourths of all ducks are raised by one processor. Approximately 10 million birds are raised at operations located in Indiana, 7 million in Wisconsin, 3 million in California, and the remaining 4 million primarily in New York and Pennsylvania.

An operation with grower ducks would typically have 13 turns per year, although a few operations have as many as 19 turns per year. As shown in Table 7–3, a count of operations from five of the seven major duck processors indicates that most facilities have fewer than 30,000 ducks at a time, and very few have greater than 100,000. Almost all are dry lot operations. Forty-nine percent of duck manure is produced by the largest ten percent of operations.

Table 7–3 summarizes the distribution of duck facilities and manure generated derived from these data.

TABLE 7–3.—DRY LOT DUCKS: FACILITY COUNTS AND MANURE GENERATED

Bird count	Number of facilities	Cumulative percentage of facilities	Manure (tons/yr)	Percentage of manure	Cumulative percentage of manure
2,500–3,000	48	100	132,000	3.6	100.0
4,000–10,000	65	77	455,000	12.5	96.4
11,000–15,000	33	45	429,000	11.8	83.8
16,000–25,000	31	29	635,500	17.5	72.0
26,000–30,000	7	14	196,000	5.4	54.5
31,000–50,000	11	10	445,500	12.3	49.1
90,000	2	5	180,000	5.0	36.9
117,000	3	4	351,000	9.7	31.9
144,000	2	3	288,000	7.9	22.2
165,000	2	1	330,000	9.1	14.3
190,000	1	<1	190,000	5.2	5.2
	205	.....	3,632,000	100.0	.....

Setting the 1,000 AU threshold equivalent at 30,000 birds for dry lot operations would result in an estimated 20 or so facilities subject to NPDES permitting, with another 70 or so potentially subject to provisions of the middle tier (300–1,000 birds) under a three-tier structure. This would account for about 45 percent of all duck operations and provide coverage for 84 percent of duck manure. Under a two-tier structure with a 500 AU threshold, about 60 facilities, or 29 percent of all operations, would be CAFOs subject to permitting, and about 72 percent of duck manure would be covered.

Alternatively, if EPA sets the 1,000 AU threshold for dry lot operations at sizes equivalent to the chicken sectors, 8 facilities would be defined as CAFOs and subject to permitting under the three-tier structure, with another 13 facilities potentially subject to the middle tier provisions (ten percent of operations covering 49 percent of manure). Under a two-tier structure at a 500 AU threshold, approximately 10 facilities, or five percent, would be defined as CAFOs, covering 37 percent of duck manure.

All of these possible alternative thresholds would represent an equivalent or, in most cases, higher threshold than is in the existing regulations and, therefore, would result in fewer duck operations being defined as CAFOs. Accordingly, EPA concludes that the costs and economic impacts that would be associated with the alternatives presented today would be lower than the costs associated with both the existing and proposed regulations regarding duck operations.

Permits for dry lot as well as wet lot duck operations would continue to be based on the existing effluent guideline, which is applicable to all duck operations with greater than 5,000 ducks.

EPA requests comment on whether to adopt either of these alternative options for dry lot and wet lot duck operations. EPA is also soliciting more complete data concerning the number and size of duck operations in the U.S.

2. Horses

EPA is considering revising the threshold for the number of horses that would determine whether or not a facility is a CAFO and subject to NPDES permitting. EPA is presenting for consideration two alternative options for revising the horse threshold that would be used in whatever approach is adopted in the final rulemaking (i.e., whether the Agency decides to adopt a two-tier or three-tier structure).

According to the Technical Development Document supporting the 1974 effluent guideline, the existing guideline applies only to commercial horse operations, defined as racetracks, resort ranches and riding stables, with more than 500 horses. It does not apply to horses kept for commercial farm use or for pleasure uses. Any commercial horse operation that meets the definition of a CAFO, and that has more than 500 horses in confinement, will continue to be subject to the existing effluent guideline as the effluent guideline for horse feedlots is not being revised in this rulemaking. The revised NPDES regulation, on the other hand, could apply to any type of confined horse operation; any permit issued to a horse operation not covered by the existing effluent guideline would contain the technology-based requirements established in the permit based on the best professional judgment of the permit writer, consistent with 40 CFR 122.44(a) and 125.3(c).

Many public commenters requested that EPA classify horses by body weight, with the assumption that one horse weighs 1,000 pounds. The existing regulations establish the animal unit

(AU) equivalent for horses as 2 AU per horse. As a result, 500 horses represent 1,000 AU under the existing regulation. A review of the 1976 Technical Development Document indicates this was based on biochemical oxygen demand (BOD) of manure from thoroughbreds, in comparison to other animal sectors. However, information EPA is making available today on manure content suggests that BOD and phosphorus content of manure from a typical 1,000 pound horse may be more similar to manure from a 1,000 pound beef cow, and that the nitrogen content of manure from horses and beef cattle may be similar. Based on this information, it may not be appropriate to adopt the reduced thresholds considered in the proposed regulation. However, the facilities most likely to be permitted are racetracks, where horses are fed a high carbohydrate diet and manure nutrient content is potentially different from that of typical horses. EPA is still analyzing data submitted to evaluate how nutrient content of race horse manure with specialized diets compares with that of horses with average diets.

Commenters also point out that, in 1976, when the original rule was written, the horse industry numbered approximately 7.5 million horses, of which one percent, or approximately 75,000, were actively involved in racing at any given time—race tracks being the type of horse facility most likely to be permitted. In 2001, there are an estimated 6.9 million horses, with one to two percent involved in racing, and are spread across the nation. Such data indicates that this industry is not growing or consolidating in the same dramatic manner that is seen in other sectors, and, combined with the relatively modest numbers of horses in confinement, poses less risk to the environment than do other animal sectors listed in the NPDES regulations.

Data submitted by industry suggest that there are 225 facilities that offer pari-mutuel horse racing in the U.S. These range from small, fair-type facilities with few stalls which operate for only a few days a year, to large commercial tracks with hundreds of stalls, operating for many months. These facilities involve Thoroughbred, Standardbred, Quarter Horse and Arabian racing. Preliminary data submitted by industry suggests that approximately 90 facilities meet the 45-day-in-confinement criterion, but the stall capacity of all of these is unclear. EPA is interested in receiving more complete information on the racetrack industry, as well as information on the number and size of non-racetrack facilities.

In order to fully evaluate additional regulatory options for horse operations, EPA would need to examine further both the manure content of racetrack horses compared to typical horses, and the extent of the potential impact of the revised thresholds on non-racetrack horse facilities. If the proposed rulemaking primarily affected racetracks, it would be reasonable to change the threshold if racehorses qualify for a change in the threshold. Therefore, EPA needs to examine whether, in fact, race horse manure is similar to beef cattle manure in quantity or content. Conversely, if the altered permitting thresholds would impact a large number of non-racetracks, it could support an upward revision of the thresholds.

TABLE 7–4.—RELATIVE POLLUTANT CHARACTERISTICS OF BEEF COW AND HORSE MANURE

Animal	Size of animal (lbs.)	BOD (lbs/day)	Nitrogen (lb/day)	Phosphorus (lb/day)
Beef Cow	1,000	1.6	0.34	0.092
Horse	1,000	1.7	0.30	0.071

Source: ASAE Standards 2000, ASAE D384.1 Dec99, Manure Production and Characteristics.

As summarized on Table 7–5, EPA is considering two alternative means for addressing the horse sector under the revised regulation.

TABLE 7–5.—ALTERNATIVE HORSE THRESHOLDS

	3-Tier (1,000 AU/300 AU) (horses)	2-Tier (assuming 500 AU) (horses)
Proposed Rule	500/150	250
NODA Option A	500/150	500
NODA Option B	1,000/300	500

In the proposed rulemaking, EPA proposed to use the existing thresholds as the basis to proportionately scale the thresholds under a two-tier structure. Thus, since 500 horses equal 1,000 AU, 250 horses would equal 500 AU.

Under the first alternative option for horses (NODA Option A), EPA would retain 500 horses as the regulatory threshold regardless of whether a two-tier or three-tier structure were selected. In other words, 500 horses would be the equivalent of 500 AU in the proposed two-tier structure, and 1,000 AU in the proposed three-tier structure. Thus, EPA would not change the horse thresholds either higher or lower, but would retain the existing thresholds in whatever structure is adopted in the final regulation. Such a decision would be premised on the recognition that this sector is relatively small and increased regulation is unnecessary. Facilities subject to the existing regulation would continue to be covered. Under the second alternative option for horses (NODA Option B), EPA would adopt commenters' suggestion to modify the threshold such that one horse would be equivalent to one AU under both the three-tier and two-tier scenarios.

EPA requests comment on the two new options, and requests that commenters supply the following additional data to assist EPA in evaluating these options: data comparing nutrient content of race horse manure to that of non-race horses; complete data on the number of confined horse operations, differentiating those at racetracks from those that are not racetracks; and the number of horses confined at each.

B. Cow/Calf Operations

EPA is considering revising how cow/calf pairs are counted in temporary confinement areas such as birthing areas of pasture-based cow/calf operations. It has not been EPA's intention to regulate (through the existing or proposed CAFO rules) pasture-based or rangeland operations. However, a farm or facility that utilizes pastures or rangeland may also have pens, lots, barns, or stables where animals are ''stabled or confined'' for portions of their lives. Provided that these areas meet the other AFO definition requirements, these confinement areas would meet the definition of AFO under either the existing rule or the proposed rule. For example, a beef operation that uses rangeland to support most of its herd may have a number of pens where animals are kept for short periods of time for birthing, veterinary care, or other purposes. Provided that these pens confine animals for 45 days or more in a 12-month period and meet the AFO definition's vegetation criteria, the pens themselves are AFOs. Further, if these pens confine the requisite number of animals and meet other conditions, the AFO would then be considered a CAFO. For purposes of determining whether the facility is a CAFO, only animals in confinement are counted.

EPA received many comments expressing concern over the impact of this regulation on small beef operations. The commenters expressed concern over a wide range of issues potentially

affecting their operations, that in the aggregate assumes EPA proposed to regulate pasture-based operations. While the final rulemaking will address the many different issues raised, EPA wishes to stress that the regulations apply only to animals in confinement. Thus, for example, a 1,000 head rangeland-based beef operation with 200 head in confinement at any given time would only count the 200 head to determine whether the confinement area meets the conditions for being considered a CAFO.

The current regulations do not distinguish between beef cattle of different size or weight. Thus, immature beef cattle have always been counted as one animal and, therefore, a cow/calf pair in confinement would be counted as two animals under both the existing and proposed regulation. As a result of public comment, however, EPA is now considering revising how cow/calf pairs are counted in temporary confinement areas such as birthing areas of pasture-based cow/calf operations. A cow/calf pair potentially would be counted as one animal, which would be consistent with how EPA treats immature animals in other sectors, e.g., dairy and swine. Such a change could alleviate concern expressed by commenters about the effects of the proposed rulemaking on small, pasture-based beef operations with temporary confinement areas.

One possible definition of a cow/calf pair would count the pair as one animal, but would count them as two animals where weaned offspring are kept longer than 120 days. EPA requests comment on whether to count cow/calf pairs as one animal in the beef sector and, if so, for what period of time offspring should be considered part of the cow/calf pair rather than counted independently.

C. State Flexibility and Innovation

1. State Non-NPDES Programs

EPA received many comments from the regulated community and from State agencies saying that many States have active and effective non-NPDES programs that, in many cases, are as effective as or more comprehensive than EPA's NPDES program, although they may differ in certain respects. Commenters felt that requiring States to implement what they view as the inflexible requirements of NPDES would drain State resources and impede effectiveness of their own programs. In particular, many State commenters asserted that facilities with less than 1,000 animal units are often best managed through these existing state programs. Some States requested complete recognition of their non-NPDES programs as ''functionally equivalent'' to NPDES, in order to exempt them from operating an NPDES program for CAFOs. Others requested flexibility to rely on State non-NPDES programs and focus NPDES efforts only where needed, particularly with respect to regulating facilities with fewer than 1,000 AU.

The Clean Water Act specifically defines point sources as including CAFOs, and authorizes EPA to issue NPDES permits to point sources. EPA may approve State programs to implement NPDES, and EPA regulations list the elements that all NPDES programs must contain. Those elements, for example, include (1) federal enforceability; (2) public participation; (3) citizen suits; (4) 5-year permit terms, and (5) permit conditions and limitations designed to limit the discharge of pollutants and protect water quality. Facilities required to be covered by an NPDES permit must obtain a permit from an agency authorized to issue NPDES permits. Thus, in order for a program to be ''functionally equivalent,'' it would have to issue permits that meet all these elements.

The requirements for State NPDES program authorization are specified under § 402(b) of the CWA and within the NPDES regulations (40 CFR part 123). These provisions set out specific requirements for State authorization applicable to the entire NPDES program.

EPA believes, however, that flexibility could be provided to State programs within the design of those portions of the NPDES program relating to CAFOs. For example, although the CWA requires CAFOs, as point sources, to be covered by an NPDES permit, it leaves the definition of CAFO to EPA. While EPA believes that the current and proposed CAFO NPDES program provides a reasonable degree of flexibility consistent with CWA requirements, we are today soliciting comment on alternatives that could more explicitly allow States to continue their non-NPDES programs while still incorporating a degree of federal oversight to ensure public accountability for protection of water quality.

EPA received many comments on whether to adopt either the two-tier or three-tier structure of the NPDES rule. Today's notice is not addressing these comments (including specific elements of the middle tier conditions in the three-tier structure, the proposed certification process, and other elements). Those issues will be addressed in the final rulemaking.

EPA through today's notice is seeking comment on ways to provide additional flexibility for recognizing the value of well-developed non-NPDES State programs. EPA believes the proposed regulation includes several options to provide flexibility under both a two-tier and a three-tier approach. Today's notice discusses two additional ways to provide flexibility for middle-tier facilities under a three-tier approach. In both these new options, EPA would still require permits of the largest CAFOs that meet the regulatory threshold, such as those with greater than 1,000 AU, but States could seek flexibility to address smaller operations (i.e., middle-tier operations with 300 AU to 1,000 AU and those with less than 300 AU) using non-NPDES programs.

Under these two options, for the middle-tier operations, EPA would set forth a definition of CAFO that could vary depending on whether the State had a non-NPDES program that adequately addressed manure management for operations of this size. If the State does have an adequate program, it would be entitled to greater flexibility in how it manages CAFOs under the NPDES program. As discussed below, this flexibility could take two basic forms. First, an NPDES-authorized State could alter its CAFO definition for middle-tier operations to contain a tailored set of conditions different from what would be in the federal regulations defining which operations of this size are CAFOs. Second, the State could adopt a simpler regulatory structure than would otherwise be required (i.e., two-tier versus three-tier). This flexibility in the CAFO definition would recognize that the appropriate management of middle-tier operations under the non-NPDES State programs minimize water quality impacts from these facilities to such a degree that EPA is justified in altering the definition of who needs to be permitted in this category of facilities.

a. State Flexibility Alternative 1: Flexibility Under NPDES for Middle Tier

The first State flexibility alternative would apply in the case where EPA would adopt a three-tier structure in the final rule. All CAFOs with greater than 1,000 AU would be required to obtain an NPDES permit; for those with fewer than 1,000 AU (or whatever regulatory threshold is selected in the final regulation), EPA would in this alternative grant specific negotiated flexibility to a State for a portion or portions of the NPDES program in order to facilitate effective State non-NPDES programs that assist smaller operations

to avoid meeting the middle tier conditions for being defined as a CAFO under NPDES. In this manner, States would be able to utilize their existing non-NPDES programs to minimize the number of AFOs that would otherwise become subject to NPDES permitting. EPA would grant the flexibility through the existing NPDES program modification process, discussed below. EPA would use the relevant program assessment criteria discussed in following sections to evaluate the adequacy of the State program in the areas of the requested flexibility.

One type of flexibility EPA might provide for middle-tier operations is negotiation of the time frame for when the revised CAFO definition would take effect within the State. The intent would be to give States sufficient time to implement their non-NPDES programs, provided that the State has a plan for active enforcement and compliance for middle-tier facilities under the existing regulation during the negotiated period. By allowing the State time to carry out appropriate management of animal feeding operations under its non-NPDES program, the effect could be that fewer operations in the State would meet the conditions for being defined as a CAFO once the revised regulations go into effect. During the phase-in period, the middle-tier conditions under the existing CAFO definition would remain in force (direct discharge, water of the U.S. running through the facility). After the negotiated phase-in period, the revised middle tier conditions would take effect.

Another type of flexibility EPA is now considering in order to recognize an adequate State non-NPDES program is to allow the State to adopt a CAFO definition that has a different set of conditions for being defined as a CAFO for the middle tier operations. EPA would work with a State to determine how to modify the CAFO middle tier conditions. For example, if the State has an alternative method for addressing excess manure statewide, a tailored condition could be devised to replace middle-tier conditions that would otherwise apply in the final rule to address excess manure. Finally, if the State has a program for targeting watersheds at risk, specific conditions or requirements could be developed to target CAFOs in those watersheds. EPA might also offer this flexibility on an interim basis. As a variation on this alternative, a State could implement for a limited period an alternative set of middle tier conditions based on those in the current regulation in order to allow the State to focus resources on high risk facilities.

This alternative could include a good faith flexibility option for first time discharges at middle-tier AFOs that are not CAFOs. The State's regulations could provide that if the State program succeeds in correcting the deficiencies at a middle-tier facility that led to the one-time discharge, the facility remains outside the definition of a CAFO if there is just that one time occurrence. Failure to correct the deficiencies in a timely way, or recurrence of a discharge, would cause the facility to be defined as a CAFO, to require a permit, and to be subject to enforcement under NPDES. Even for first-time discharges, however, owners or operators would have a duty to *notify* the permit authority and to seek assistance in correcting the problem. Failure to do so would result in a reporting violation under Section 308 of the CWA.

EPA seeks comment on this flexibility and on other possible specific means of granting flexibility that States may be interested in to facilitate implementation of their non-NPDES programs for middle-tier facilities. EPA also seeks comment on ways the State could demonstrate an assurance that the program will continue to meet the criteria used to obtain approval for the State program, described below.

b. State Flexibility Alternative 2: Opt-Out From NPDES for State Programs Covering Facilities Below the CAFO Threshold

In the second State flexibility alternative, EPA would recognize effective State non-NPDES programs by allowing States with such programs to define CAFOs under a two-tier NPDES structure, while other States would be required to continue to define CAFOs under a three-tier structure. In this alternative, under the two-tier structure, facilities over 1,000 AU (or the final regulatory threshold) in States with approved non-NPDES programs would be CAFOs and would be required to obtain an NPDES permit while facilities with fewer than 1,000 AU would not be CAFOs, unless designated by EPA or the permit authority.

In this alternative, when States amend their NPDES programs to incorporate the requirements of the final revised regulation, they would submit a description of their non-NPDES program for smaller AFOs, those under 1,000 AU. EPA would evaluate, as part of the modification review process, whether the State non-NPDES program provides enough assurance such that EPA could determine that the AFOs in the middle tier posed sufficiently lowered risk of discharging as to make them unlikely to be considered a point source. Upon approval by EPA, the State would be allowed to operate under a two-tier NPDES structure, in which permits would be required only of large CAFOs (e.g., those over 1,000 AU) or those that are designated. States that do not apply for this alternative, or States that fail to obtain approval of their alternative program, would be required to implement the middle tier requirements of the three-tier structure, assuming it is adopted in the final regulation.

In this case, although States would not be operating an NPDES permitting program for the middle tier, federal accountability would still be retained since the State would be expected to pursue NPDES permitting and enforcement actions against facilities that continue to fail to adopt the controls called for under the State AFO program. States would still have the authority to designate AFOs below the regulatory threshold as CAFOs and, under the proposed rule, EPA itself could also designate facilities of this size as CAFOs if the State has not done so.

EPA is soliciting comment on the flexibility options described above, and is also seeking additional comments on other approaches to provide States with greater flexibility, in recognition of effective State non-NPDES programs for manure management.

c. EMS as a Basis for State Flexibility

States would be encouraged to consider the use of Environmental Management Systems (EMSs) as a tool in either of the flexibility options described above to enhance their State programs, particularly in areas such as manure management, identifying and tracking AFOs, providing systems of accountability, and public participation. EMSs can be a key aspect of a permitting and/or voluntary program in achieving environmental goals and addressing a full range of significant environmental impacts. EMSs currently are being used in certain portions of the AFO industry. As discussed more fully in the section below entitled ''Environmental Management Systems,'' EPA is considering several additional options for including flexibility in the regulations to recognize the value of EMSs as a tool for helping operators to achieve performance goals.

d. Process for Granting Flexibility

EPA envisions that under the alternatives described above, a State would be required to apply for the flexibility it is interested in when it submits an NPDES program modification in order to implement the final CAFO rule. (A State could also do

so at a later date, but would be required to adopt EPA's approach for regulating middle-tier facilities until an alternative State program was approved.) EPA could require public review of the proposed modification by designating the modification as a ''substantial modification'' under 40 CFR 123.62. The NPDES program modification process is described in 40 CFR 123.62 and in guidance issued in 1986 (National Pollutant Discharge Elimination System State Program Guidance for Development and Review of State Program Applications and Evaluation of State Legal Authorities, at 40 CFR parts 122–125 and 403, Volume One, July 29, 1986). The regulations provide that EPA can make a case-by-case determination for each modification as to whether it is ''substantial'' and, therefore, must undergo public notice and comment prior to approving the modification. The basis for making this determination as described in the guidance is (1) the degree of public interest and (2) the magnitude of change to the State's program.

EPA seeks comment on this approach and on the advisability and need to seek public comment prior to granting any flexibility.

e. State Program Assessment Criteria

EPA would establish performance criteria for any alternative non-NPDES State program that is a candidate for NPDES CAFO program flexibility to assure national consistency in facility standards and environmental outcomes. Presented below are a set of performance criteria EPA is considering for making this evaluation. These criteria would enable EPA and the public to assess a State's readiness to operate part or all of its non-NPDES program in lieu of the final rule's requirements for the middle tier. EPA seeks comment on the criteria and their ability to serve as the basis for an assessment of non-NPDES State programs.

The most revealing measure of a State program's effectiveness at reducing the risk of a discharge from AFOs would ultimately be water quality monitoring data and attainment of state water quality standards. EPA is considering whether and to what extent this type of information could be useful in evaluating the effectiveness of the State program. Among the challenges to be addressed would be a need to understand how existing water quality data, including whether the State is achieving water quality standards, could predict the effectiveness of State programs in preventing future discharges and/or maintaining water quality standards in the future. EPA requests comment on these issues.

In addition to actual water quality monitoring, EPA believes certain programmatic performance measures can serve as criteria for assessing the effectiveness of a State program. While favorable answers to questions posed under each criterion in and of themselves do not guarantee program effectiveness, collectively they can serve as indicators of environmental performance and are generally viewed as characteristic of State programs that exhibit leadership in feedlot management. Therefore, to be considered effective, EPA is considering requiring through the regulations that any alternative State program would need to meet some or all of the following criteria, which are discussed in more detail below: (1) Identify and track AFOs in a systematic manner; (2) adopt facility standards for development of technically sound CNMPs for all AFOs and zero discharge from the production area; (3) establish performance measures that provide feedback on the efficacy of CNMPs; (4) implement a system of accountability (e.g., inspection, compliance, enforcement); (5) demonstrate resources are adequate to meet program objectives, including delivery and management mechanisms for technical assistance and funding; and (6) contain provisions for public participation that meet or exceed CWA objectives for participation.

Through today's notice, EPA seeks comment on these criteria as a valid basis for assessing whether a State non-NPDES program is sufficient for allowing the flexibility in the CAFO definition described in this section. EPA also seeks comment on any burden associated with meeting these criteria and whether there is an alternative set of criteria (including some or all of these or other criteria), which would increase flexibility for State non-NPDES programs while ensuring adequate protection of water quality from CAFO discharges.

Identify and track AFOs. EPA has observed in the past that a State's ability to track its AFOs is highly correlated with a program's effectiveness. To assess a State's ability to meet this criterion, EPA would need to determine that the State's program adequately and reasonably addresses the following elements: (1) How does the State identify and track AFOs? (2) Is there a State permitting or registration program for smaller AFOs? (3) What thresholds are used for permits, registration, or other tracking mechanism? (4) What terms and conditions are used for permits or registration? (5) How many facilities are covered by State permit(s)/registration compared to absolute numbers of AFOs? (6) In which cases does the State use non-NPDES general permits and individual permits?

As an example of a effective tracking program, EPA is aware of one State that has a comprehensive registration component that serves as a basis for referring facilities for technical and financial assistance. To identify the target universe of AFOs, the State works with local conservation districts to inventory the facilities. This information is then entered into a tracking system, and serves as the basis for scheduling site visits to the AFOs.

EPA requests comment as to what extent AFOs should be identified and tracked to assure environmental performance of non-NPDES State programs. EPA further solicits examples of how this is done in effective State programs.

Facility standards for development of CNMPs and for zero discharge from the production area. The goal of the NPDES provisions in the CAFO rule is to minimize environmental impacts either directly from a facility's animal production areas or through the use and application of the nutrients generated at the facility. Therefore, EPA would need to find that an alternative State program at a minimum provides for adequate development of CNMPs and ensures that facilities will meet zero discharge standards. To evaluate a State's ability to meet this criterion, EPA would need to evaluate the following: (1) How will the State work with AFOs to help them develop CNMPs? (2) How are overflows from manure storage areas prevented? (3) What lagoon seepage rate is allowed? (4) What other controls does the State promote?

The goal of the USDA/EPA Unified Strategy for Animal Feeding Operations is to promote development of CNMPs for all AFOs. A CNMP incorporates conservation practice standards that go beyond basic nutrient management planning, and incorporates a variety of practices to preserve water quality. In addition, the EPA proposed regulation includes a zero discharge standard, requiring beef and dairy facilities to be designed, operated and maintained to prevent discharge in less than a 25-year, 24-hour storm, and limiting swine and poultry facilities from discharging in any non-catastrophic storm. EPA would evaluate whether the State program adequately addresses both the CNMP and zero discharge goals. EPA solicits comment on whether and to what extent requirements for CNMPs and zero discharge from the production areas for

AFOs in the middle tier could be met through State Non-NPDES programs.

In general, EPA would take into account all aspects of the State program that demonstrate control of pollutants from AFOs. To that end, EPA would also take into account features of the program that go beyond direct NPDES requirements, such as bans on new construction, phase-out of lagoons, or controls on air, odor or ground water. An example of a program that goes beyond the proposed NPDES requirements is a State that requires AFO operators to seek and obtain construction permits based on design standards that are more stringent than NPDES standards. Other examples may exist as well, and EPA would welcome such information.

Establish performance measures. An effective State program would need to have in place measures that provide feedback on the program's ability to control water quality impacts from nutrients, sediment, and other conventional and nonconventional pollutants associated with CAFOs. Despite the challenges often inherent in collecting and analyzing these data, EPA believes that a State's activities in establishing environmental baselines and measuring trends (e.g., trends for nutrient loading) can help demonstrate the program's intent and maturity. In assessing a State's performance measures to control water quality impacts, EPA would consider whether the State has undertaken efforts to understand sources, fate, and transport of pathogens and antibiotics since this is an emerging water quality issue. EPA requests comment on what kind of performance measures, if any, EPA should consider requiring.

Implement a system of accountability. Facility standards, however rigorous, are without value if there is no corresponding effort to ensure adherence to the standards. Consequently EPA believes that an important indicator of an effective State program is how the State works with facilities once they are identified as AFOs. EPA would evaluate whether the State's program provides adequate accountability based on the following criteria: (1) What is the frequency of inspections or site visits? (2) What happens once a complaint is received? (3) What is the relationship with EPA? (4) How is EPA kept informed of actions at facilities? (5) At what point are federal enforcement authorities applied? (6) What steps are taken if a problem or potential problem is detected at a facility (e.g., referral to local industry group, agricultural agency, or other organization for technical assistance services; regulatory agency compliance/enforcement procedures; fines; etc.)? (7) What voluntary efforts are underway to aid facilities in achieving facility standards? (8) Does the State regularly track and evaluate the magnitude and resolution of problem/discharge reports?

States currently have a variety of approaches for ensuring that AFOs adhere to standards. One obvious indicator of effective follow-through would be the vigor of the AFO program's inspection, compliance and follow-up component. These measures must however be analyzed carefully to determine their true correlation with program efficacy. For example, one State AFO program inspects facilities twice a year, as part of its non-NPDES program. However, critics of this particular program note that the State takes little subsequent action to follow up with facilities once a problem is detected. Another example of a program that might be viewed critically is a case where the State has permitted all AFOs down to a very low threshold, but rarely inspects or performs site visits to assess compliance at individual facilities.

AFO programs for smaller facilities could still be judged as providing appropriate oversight regardless of whether the State makes extensive use of permits and enforcement orders. For the majority of AFOs, voluntary programs are often the most appropriate means for guiding the facility to achieving any design or operating standards. For example, one State with an active program uses a graduated system of referrals under which operators who fail to address problems in a timely manner are first referred to technical assistance groups, then State support programs, and then State regulatory programs. If the facility still is deemed to present a problem, it may ultimately be ''designated'' as a CAFO and be required to apply for a permit.

Other States offer varying degrees of technical assistance, and may promote or fund environmental assessment programs such as the America's Clean Water Foundation On-Farm Assessment and Environmental Review (OFAER). For example, one State has an AFO program that provides more funding for AFOs in that State than does EPA and USDA combined. With this in mind, the Agency would plan to give due weight to a State's technical assistance program, including elements that offer education, training, technical or financial assistance.

Demonstrate adequate resources. To be considered effective, a State would also need to demonstrate that it possesses adequate resources to meet the program's objectives. Beyond obvious concerns for staffing and program budgets, EPA would also be interested in State efforts to deliver program resources to particular environmental problems. For example, EPA would evaluate: (1) Is there a State-wide manure management program? (2) How does it work? (3) What mechanisms does the State use for targeting or prioritizing actions on specific AFOs or groups of AFOs (e.g., targeting based on sector of concern, watersheds at risk, citizens complaints). (4) How does the State use non-point source information to guide actions on AFOs?

A State-wide manure management program, for example, could help target geographic areas where nutrient production exceeds demand, and could assist in locating other jurisdictions where a shortfall exists. Another example of environmental targeting occurs in a State whose AFO program uses a watershed-based approach to prioritize actions on facilities. Even though this particular State issues permits on a 10-year cycle (rather than the 5-year cycle called for under NPDES), the program is widely respected for its ability to control AFO impacts in at-risk watersheds. Other States have programs that target inspections and technical assistance to AFOs based on geographic concentration of facilities.

EPA seeks comment on these measures to evaluate whether States possess adequate resources for program objectives and whether alternative measures would be appropriate.

Provisions for public participation. EPA does not believe that a State with a non-NPDES program should receive flexibility without assurance of adequate public participation in its development and implementation. To evaluate State efforts in this area, EPA would assess the adequacy of all of the following factors: (1) Stakeholder involvement in program development and implementation; (2) opportunity for public input on permit issuance; (3) opportunity for the public to request hearings on permits; (4) public availability of permit/registration information; (5) method of tracking and responding to citizen complaints; and (6) provisions for appeals and citizen suits.

EPA requests comment on the appropriate level of public participation in non-NPDES programs and whether these or an alternative set of factors would be more appropriate for States, to ensure adequate public participation.

EPA seeks comment on which of these would be critical factors in making

its determination concerning program adequacy.

EPA in general requests comment on the various ideas for flexibility discussed today, and on how any aspect of them might be used in combination to achieve the goals of providing enhanced flexibility for State non-NPDES programs while ensuring appropriate assurances to the public for protection of water quality from CAFO discharges.

D. Environmental Management Systems

EPA is soliciting comment on three new options concerning the use of environmental management systems (EMS). In the preamble for the proposal (at 66 FR 3027), EPA described an option under which a processor would not be required to be co-permitted with its producer(s) if the processor developed an EMS that met certain conditions. Reactions to this specific option and to EMSs in general were mixed. In light of discussions with stakeholders and further information on the use of EMSs in other industries, EPA is continuing to consider how best to incorporate EMS-based alternatives into the final rulemaking. Today's notice outlines additional ways in which EPA is considering incorporating EMS-based alternatives into the final regulations as a way of providing States with flexibility in managing their CAFO programs.

EPA is also setting forth an EMS protocol, or framework for an acceptable EMS, that it is considering incorporating into the regulations. EPA might require States to adopt such a protocol if they want to offer these EMS-based options. EPA is soliciting comments on this protocol.

The four potential EMS options that EPA is now considering, as discussed below, are: (1) EMS Option 1: Modified Permit Requirements for Facilities > 1,000 AU; (2) EMS Option 2: EMS as a Basis for Excluding Operations from the CAFO Definition for facilities with 300 AU to 1,000 AU; (3) EMS Option 3: EMS as a Basis for State Flexibility in Defining Who is a CAFO for 300 AU—1,000 AU; and (4) EMS Option 4: Co-permitting.

EPA recognizes that developing an EMS, including successful completion of third-party audits, would cause a facility to incur certain costs. Therefore, in addition to soliciting overall comments on these EMS-based alternatives, EPA would like to get any information on the existing costs of EMS implementation for animal feeding operations, both on a per-facility and organization-wide basis. Types of costs that could be relevant include staff and consultant costs, costs of upgrading operations to make them conform to the EMS elements contained in this notice, and costs of completing third-party audits. EPA will consider this information carefully as it determines whether EMS-based alternatives should be included in the final rule. EPA is also requesting any available information on the performance of EMSs in addressing regulated and unregulated environmental impacts.

A simple definition of an EMS is a continual cycle of planning, implementing, reviewing, and improving the actions an organization takes to meet its environmental obligations. These obligations include, but need not be limited to, regulated activities. First adopted by manufacturing industries, EMSs are now being increasingly used in the U.S. and throughout the world by various industry sectors, including animal agriculture, and by a growing number of public agencies. EMSs provide organizations with powerful tools to assess environmental impacts systematically from a wide variety of activities, many of which are not regulated, and to reduce these impacts over time. Common examples of activities typically not subject to federal regulation that can be addressed through an EMS include odor, noise, and energy consumption. Benefits may include cost savings, increased operational efficiency, risk reduction, improved internal communication, and improved relations with external parties. EMSs typically incorporate a feedback mechanism that supports measurement of performance against a set of measurable objectives and provides a mechanism for correction or preventive action. Implementing an EMS provides an organization with a broad-based yet flexible way of managing a full range of environmental issues. Best management practices (BMPs) can, and often do, provide the substantive underpinning of an effective EMS, but BMPs alone cannot substitute for a dynamic management *system* that reduces current risks and provides a way of anticipating future risks, and addressing these risks, before they cause a significant environmental impact.

The EMS, by its nature, is designed to address multiple pollutants and pathways. While potentially less prescriptive and more flexible than regulatory requirements for a particular pollutant or pathway, an EMS would offer compensating, and potentially offsetting, environmental gains from other measures such as air pollution control, dust control, and having an emergency response plan in place. An EMS provides the operator of the animal feeding operation with an efficient and effective means of analyzing the sources and pathways of pollution at the facility, identifying appropriate controls, and assessing progress against identified goals. An EMS alternative in the regulations would need to take into account all forms and sources of pollution and would describe a facility's commitment to implement strategies, identify needed investments in structures and changes in practices, and develop emergency response plans to minimize all forms of pollution that could reach the waters of the U.S.

The basic elements of an EMS, whether they are based on the ISO 14001 International Standard or a more industry-specific model, are not new and have proven they have the potential to be effective in a variety of settings. To make effective use of EMSs in the CAFO regulations, EPA believes it is important that relevant stakeholders be given an opportunity to provide input to the facility as the EMS is developed, that information on the performance of the EMS be readily available to regulators and the public, and that some form of independent third party verification be included as means of ensuring public confidence. A May 2001 National Academy of Public Administrators (NAPA) report on third party auditing of EMSs under ISO 14001 noted that given the public policy implications, it is important to ensure credible and consistent results so that all who rely on an EMS, including the public, have appropriate expectations of what it represents. The options described below contain these important features.

EPA has been involved in strategically promoting the voluntary adoption of EMS for several years, and described its policy in its 1999 report ''Aiming for Excellence—Actions to Encourage Stewardship and Accelerate Environmental Progress.'' This report states that ''we will encourage organizations to use EMSs that improve compliance, pollution prevention, and other measures of environmental performance.'' Copies of this report are available at www.epa.gov/reinvent/taskforce/report99. EPA has also developed an action plan that identifies a wide range of activities the Agency will undertake to follow up on the recommendations of the Report.

Some of the key EMS-based programs EPA is supporting, in partnership with industry and others, are the National Environmental Performance Track, the United Egg Producers XL Project, and the National Biosolids Partnership EMS program. More recently, the Agency has begun to work with selected meat

processing facilities in the Midwest to help them adopt EMSs, using an EMS guide tailored to these types of facilities. In addition, certain companies in the animal feeding operations industry, such as Smithfield and Premium Standard Farms, have adopted formal EMSs under the ISO 14001 International Standard for their operations to help improve their compliance records. While EPA does not specifically endorse the efforts of these companies, we note the existence of their EMS programs simply to point out that the EMS concept is not new in the AFO industry.

1. EMS-Based Regulatory Options

Today, as a result of information received since the proposed rule was published, EPA is soliciting comment on three additional potential approaches for incorporating EMS-based options in the CAFO regulations. In the proposed rule, EPA solicited comment on EMS as an option for co-permitting. The three additional options that EPA is now considering would make the EMS-based flexibility more generally available to both large and medium size CAFOs.

In general, these EMS-based approaches would be based on a recognition that a comprehensive EMS program made available by the State and implemented by the facility would have the effect of reducing the facility's point source-like attributes—more specifically, reducing its potential for a discharge to the waters from a discrete, identifiable and controllable source. Accordingly, because these facilities would have fewer attributes of a point source, and given EPA's discretion to define who is a CAFO point source under the Clean Water Act, EPA would conclude that it is appropriate to scale back or eliminate certain middle-tier operations that employ the EMS approach from being defined as CAFOs. In the case of Option 1 below, EPA would not exclude large operations from the CAFO definition where they implement EMSs but would simply find it appropriate to curtail some of the technology-based requirements that would otherwise apply, recognizing that the EMS activities would make those requirements unnecessary.

a. EMS Option 1: Modified Permit Requirements for Facilities > 1,000 AU

Under the original CAFO proposal, all facilities over 1,000 AU would be required to obtain an NPDES permit, with limited exceptions. In Option 1, the permit authority could develop an EMS program consistent with EPA's framework that would grant certain flexibility to permittees such as coverage under a general permit, modification of selected requirements in the effluent guideline, or reduced reporting requirements. EPA could define certain elements of the effluent guideline that could be modified for facilities that adopt an EMS. EPA is soliciting comment on which types of permit requirements it may be appropriate to amend if a facility of this size implements an EMS program.

b. EMS Option 2: EMS as a Basis for Excluding Operations From the CAFO Definition for Facilities With 300 AU–1,000 AU

Under the second potential approach, EMSs could also be used by those animal feeding operations in the middle tier of the three-tier structure (those between 300 AU and 1,000 AU). Under the proposed regulation, owners or operators of middle tier facilities would be defined as CAFOs unless they certify that they do not meet certain criteria (that are adopted in the final regulation) that indicate a risk of discharge to the waters. Specifically, in the proposed rulemaking, the facilities in the middle tier would be required to demonstrate the following to not be defined as a CAFO: (1) Waters of the United States do not come into direct contact with the animals confined in the operation; (2) there is sufficient storage and containment to prevent all pollutants from the production area from entering the waters of the United States; (3) there has not been a discharge from the production area within the last five years; (4) no part of the production area is located within 100 feet of waters of the United States; (5) in cases where manure or process-generated wastewater are land applied, they will be land applied in accordance with a Permit Nutrient Plan.

Under this EMS option, a State could adopt an alternative condition that would exclude a middle-tier facility from being defined as a CAFO if the facility demonstrates that it is carrying out an appropriate EMS. The operation would need to show that it has successfully completed an independent third party audit of its EMS. Among other things, the EMS would need to ensure that the operation achieves zero discharge from the production area, and that it has a CNMP in place that ensures that manure is land applied in accordance with proper agricultural practices.

A determination of the adequacy of the EMS would be made during the initial third-party EMS audit, described in more detail later in this notice. Any facility that failed to properly implement its approved EMS would become a CAFO and be required to obtain a permit. More discussion of potential implementation issues follows later in this section.

c. EMS Option 3: State Flexibility for 300 AU–1,000 AU

Under the third approach, an NPDES authorized State could seek to rely on its EMS program as a basis for requesting flexibility in how it defines which AFOs in the middle-tier become CAFOs. Once it found that the State had an adequate EMS program, EPA could approve State CAFO regulations that contain a modified set of conditions for defining who is a CAFO, or could approve State regulations that define CAFOs under a two-tier rather than a three-tier structure. Please see the above section on State Flexibility for a complete discussion.

d. EMS Option 4: Co-Permitting

Please see the discussion in the proposed rule (66 FR 3027) of the use of EMS to waive the requirement for co-permitting. In this option, the permit authority could waive the requirement for co-permitting entities that exercise substantial operational control over a CAFO if the entity adopts and implements an EMS for its contract producers. The EMS could include elements to effectively manage excess manure.

2. Potential Evaluation Process and Standards

Under each of the four EMS options, a State would first need to develop an EMS program under one of the alternatives listed below, and would need to obtain EPA's approval. As described earlier in the discussion of State Flexibility, the State EMS program would need to be evaluated and approved by EPA as part of the NPDES program modification process. EPA is considering providing in the regulations that a State EMS program would be acceptable where it meets one of the following:

Alternative 1: State program requires the operation to adopt an EMS that meets the ISO 14001 International EMS standard and certain other EMS requirements specified below;

Alternative 2: An authorized State could develop its own EMS program standards, and require the operation to adopt an EMS that meets these standards. To be approved by EPA, the State EMS program would need to be consistent with the EMS elements described below. EPA would develop guidelines for an acceptable EMS program for use by States.

EPA would find that a State had an adequate EMS program only if the

program required an operation to certify that it meets the standards of ISO 14001. Alternatively, the program could allow operations to certify to a different set of standards as long as EPA found that they were no less stringent than ISO 14001. As further criteria that EPA is considering for an adequate EMS program, the program would need to require each operation to demonstrate that it had (1) provided interested community members with a reasonable opportunity to provide input to the facility as its EMS was developed; (2) demonstrated how it had responded to this input; (3) maintained ongoing communications with community members and other stakeholders as the EMS was implemented and addressed relevant issues raised by these stakeholders; (4) made the results of successful third party audits publicly available, either at the facility or through the regulatory agency; and (5) developed and was implementing a CNMP in accordance with NRCS 590 guidelines. EPA specifically requests comment on these criteria.

EPA believes that all operations that seek to be excluded from being defined as a CAFO on the basis of implementing an EMS would need to meet the State program criteria, as determined by passing a third party audit. EPA believes that independent third party audits provide a high degree of confidence that the EMS is in place and is being implemented in a consistent and credible manner, including helping to assure compliance. However, EPA realizes that these audits may pose a significant cost burden to certain small facilities. Therefore, EPA is also seeking comment on alternatives to requiring each facility to complete the audit, including approaches like self-certification of the EMS, risk-based auditing, and random auditing, and the way in which these alternatives would provide the appropriate level of confidence for regulatory agencies and the public, as EPA believes requiring third party audits for all facilities would provide.

A facility deciding to make use of the EMS option would have until the effective date of the new NPDES CAFO regulation (approximately January 2006) to get an approved EMS in place. At that time, consistent with the proposed rule, all facilities that meet the definition of a CAFO would be required to either obtain an NPDES permit or have an approved EMS in place which would entitle them to be excluded from the definition. The State program could also allow facilities that had already applied for or obtained permits as CAFOs and that later developed an EMS to be excluded from the definition at that time.

EPA is requesting comment on the standards the State EMS program must meet, and on how States would obtain approval from EPA for implementing such a program.

3. Potential Elements of an AFO EMS

EPA believes that an EMS has the ability to enhance environmental protection, especially if it includes the evaluation and abatement of all forms of pollution. This includes pollutants that may not currently be regulated in some areas, such as air deposition of nitrogen from hog lagoons, which has been found to be a major contributor to nitrogen loadings in streams and rivers. The ability to control multiple pollutants and pathways in a holistic manner could foster greater control of agriculture's negative impact on the environment, potentially at lower cost to producers.

Accordingly, EPA is considering that, in order to deem the AFO EMS sufficient, the State program would require a facility to develop and carry out a plan to evaluate and effectively address the environmental impacts of the facility across multiple media and pathways. The pathways that the facility would need to address, for example, could include air deposition of contaminants to the waters and odor and pest control. It is within EPA's discretion to define which operations are CAFOs. EPA believes that under this regulatory alternative, multiple pathways of contamination should be addressed by an EMS in order for a middle-tier operation not to be considered a ''concentrated'' animal feeding operation under the regulations. EMSs, by their very nature, allow organizations to decide the relative degree of emphasis and attention that needs to be given to a particular environmental issue. For example, if the facility's own assessment and input from community members and other stakeholders indicated that odor was not a significant issue, the facility could continue to manage odor issues as it had been doing. However, the facility would need to maintain ongoing communications with the community and be in a position to take additional steps to deal with odor issues, as part of its EMS, if odor were to become a significant issue in the future.

Additionally, EPA is considering specifying in the regulations that, in order for an AFO EMS to be deemed sufficient, it would need to ensure, among other things, zero discharge from the production area. Also, an acceptable AFO EMS would need to require the facility to have a CNMP. The CNMP, to be sufficient, would need to assure land application of manure at proper agricultural rates and require employment of BMPs to minimize discharges to waters of the U.S. from the production area and the land application area. These requirements would need to be established as specific objectives in the EMSs against which the facility's performance would be evaluated and its EMS conformance audited.

A critical element for EPA to approve of an EMS would be the third party audit process and local public participation. Local participation is essential as it is local residents that will be impacted most directly by discharges from the operation.

As described earlier, a State would be required to submit a description of its overall EMS program to EPA for approval. The program description would need to contain a description of how the adequacy and effectiveness of each element would be determined through independent third party EMS audits conducted at each facility seeking the regulatory relief under one of the options described above. The program description would also need to include other program elements that would be determined in the final rule. EPA is considering the set of program elements outlined below and solicits comment on them.

When EPA evaluates a State's EMS program under Alternative 1, it would assess whether the program adequately addresses the following elements. It would also be EPA's intention to address these items in national AFO EMS guidance discussed in Alternative 2 above:

Environmental Policy—A written statement of policy committing to ensure compliance with all applicable regulatory requirements, pollution prevention, ongoing improvement of environmental performance, including areas not subject to regulation, in order to reduce negative impacts on the environment over time, and sharing information with stakeholders on environmental performance against EMS objectives and targets;

Environmental Planning—A process to: (1) Identify all environmental impacts of the facility, assess significant impacts, and prioritize them by significance across all media and all pathways; (2) document all applicable federal, State, and local environmental legal requirements (e.g., pesticide storage and handling, odor control, air emissions, oil and grease) and the facility's compliance with those requirements; (3) set objectives and

measurable targets consistent with the impact assessment and commitments described in the policy statement which, at a minimum, should include the following: (a) zero discharge from production area; (b) development and implementation of a CNMP; and (c) under the CNMP, provisions to ensure land application will be performed in accordance with proper agricultural practices.

Implementation of Policy and Plan—Adoption of appropriate USDA-or State-endorsed conservation practice standards to help meet the EMS objectives and targets (using USDA handbook or other relevant guidance), including: (1) Implementation of a CNMP; (2) adoption of necessary operational controls and procedures to ensure that the EMS is effectively implemented; (3) proper employee training and clear employee roles and responsibilities that address implementation of the EMS at the facility; (4) CNMP certification; (5) implementation of conservation practice standards (including documentation that necessary practices have been installed, their operation has been verified periodically, and any performance deficiencies have been identified and that the facility has outlined and implemented steps to correct the deficiencies); (6) documentation of procedures for an emergency action plan; and (7) appropriate conservation practice standards required for pest control, odor management, dead animal disposal, and preventative maintenance.

Community Involvement/External Communications—A process to allow interested community members and other stakeholders to provide input to the facility as its EMS is developed. The State should show that its program calls for facilities to demonstrate how they responded to this input as part of the third-party audit. Under this element, each facility should be required to maintain regular communications with these stakeholders on the performance of the EMS as it implemented and address relevant issues raised by these stakeholders. In addition, information on the results of third party audits must be publicly available. EPA seeks comment on the most appropriate method of sharing this information, and the appropriate level of detail that should be included for any information that is shared. EPA seeks comment on the most appropriate method of sharing the audit results, including web site publication. EPA is also seeking comment on the content, frequency and level of detail of audit results and whether there are confidential business information concerns that need to be addressed.

Checking Progress and Success of EMS—The State should have a process that causes facilities to: monitor conformance with the EMS and compliance with applicable laws; maintain records that document EMS implementation and compliance; and conduct internal EMS audits and internal reviews by facility management of the overall performance of the EMS on an ongoing basis.

Independent Third Party Audits—As described earlier, EPA is soliciting comment on an approach that would require all facilities to successfully complete an independent audit of the EMS by a qualified third party organization before becoming eligible for the EMS alternative, but is seeking comments on other approaches such as random auditing, risk-based auditing, and/or self-certification of the EMS. The Agency is requesting comment on the appropriate frequency for independent follow-up audits (e.g., annual or less frequent basis). Such follow-up audits would not have to be full audits but rather could be targeted to audit certain components of the environmental management system such as record keeping, communication, or others. The independent third-party auditing program, including qualifications of auditors, would need to follow auditing guidelines developed by the State and approved by EPA as part of the State's EMS program. Results of all third party audits would need to be submitted to the regulatory authority in a timely manner and available to the public upon request.

Examples of third party auditors that EPA is considering finding to be qualified under the regulations include certified CNMP specialists, OFAER-trained assessors/auditors (On-Farm Assessment and Review), and ISO 14001 certified auditors with appropriate animal agriculture background.

EPA seeks comment on the appropriate elements of a State EMS program.

4. Further Criteria for an Adequate EMS-Based Program

This potential EMS framework raises implementation issues that EPA would need to address in the final rule should we go forward with the approach. EPA solicits comments on the six EMS elements discussed above as well as each issue area described below and the options for addressing the issues.

Facility operator qualifications/eligibility criteria. EPA seeks comment on eligibility criteria for determining whether AFOs should be allowed to implement EMSs in lieu of applying for permits. The purpose of the criteria would be to screen the AFOs to ensure they can demonstrate an appropriate compliance history and commitment. For example, EPA could specify in the final rule that if the AFO has had a violation (i.e., a discharge to a water of the U.S.) within a certain number of years, e.g., five, the owner/operator would have to demonstrate that the violation was corrected and steps taken to prevent recurrence. EPA may also wish to specify that persons whose compliance history includes certain types of serious violations, e.g., criminal violations, must always apply for permits. The permitting authority may be in the best position to determine at the outset whether an AFO's compliance history should exclude it from participation. Other screening factors may come into play only during the initial third-party EMS audit, described in more detail later in this notice. EPA also seeks comment on the timing of the screening.

Frequency of self and third-party auditing. Once a facility has an approved EMS in place, to ensure it is being implemented appropriately, periodic follow-up through self and third-party auditing and certification will be needed. EPA solicits comment on how frequently the follow-up auditing should be specified in the regulations. For example, EPA is considering requiring facilities with EMSs to conduct follow up self-audits every six months, and third party audits every one to five years.

Correction of EMS nonconformances/return to CAFO status. Despite best efforts, some facilities will experience EMS nonconformances, potentially including noncompliance with key EMS conditions such as the requirement for zero discharges. Such EMS nonconformances can range from minor problems with no significant environmental impacts that can be easily corrected and are unlikely to be repeated, to serious or even criminal problems which lead to imminent and substantial endangerments, significant environmental impacts, or continuing discharges.

EPA solicits comment on the best approach, or combination of approaches, for reacting to and addressing EMS nonconformance under an EMS program. EPA's intent is to balance the need to provide AFOs with incentives to participate in the EMS program, including certainty as to their NPDES status and how their nonconformances will be handled, with the need to ensure that permitting

authorities can react promptly and effectively to serious problems, including, if warranted, issuing CWA administrative orders with compliance schedules or injunctive provisions.

There are a range of options that EPA is considering to address this issue. They are not mutually exclusive. For example, EPA could distinguish between facilities with significant and insignificant problems. The final rule could provide for the former to return to the NPDES permitting program, while allowing the latter to correct their nonconformance problems under their EMSs with no change in AFO status.

Some approaches EPA could employ in this regard include the following: (1) The final rule could provide for AFOs with significant discharges to revert automatically to CAFO/ NPDES status upon discharge and be required to apply for NPDES permits; (2) Rather than operate automatically, the rule could authorize the permitting authorities to designate AFOs with significant discharges as CAFOs, if determined to be appropriate; (3) AFOs which revert to CAFO status could be required to apply for NPDES permits immediately, or CAFO status could be deferred, allowing the permitting authorities the discretion to require permit applications when deemed necessary; (4) AFOs could correct noncompliance problems which are not significant under the EMS program, without any effect on their status as non-CAFOs (unless they do not correct the problem), pursuant to established guidelines and time lines.

Time line for obtaining EMS or permit. EPA believes it would be appropriate to implement the EMS option in the same time frame as the proposed regulation, i.e., States and facilities would have three years following promulgation of the final rulemaking to develop and implement EMS programs and plans. EPA solicits comment on an appropriate time line for implementing the EMS-in-lieu-of-permitting requirements for participating facilities. For example, a facility deciding to opt out of a permit under this option could be given until 2006 to get an approved EMS in place. At that time, all facilities that meet the CAFO criteria would have either obtained a NPDES permit or developed and implemented an approved EMS.

EPA seeks comment on any further criteria that it may be appropriate to specify as necessary for an adequate State EMS program.

5. Potential Components of Third-Party Auditing Program

An effective third-party auditing program is essential to the credibility of any EMS, including the EMS options described in today's notice. The auditing program would need to provide States, EPA, participating facilities, and the public the essential information to determine if the EMS is being implemented in a manner consistent with the guidelines outlined above. At the time a State submits its overall EMS program to EPA for approval, it would be required to also describe how the third-party auditing system will work by describing the following features of the program: (1) The process by which a facility may apply to the State for participation in the EMS program; (2) The written EMS guidance or other guidelines that will be used by auditors when auditing each facility, consistent with the EMS elements described above; (3) The specific EMS auditing qualifications for auditors, and other relevant qualifications, including minimum educational, training and/or hands-on experience requirements, such as expertise in agricultural engineering, nutrient management and field management; (4) The content, frequency and level of detail of audit reports and the mechanism for making this information available to the public (audit reports must include all the elements listed above); (5) The frequency and scope of follow up audits that will take place to confirm that the facility is continuing to adequately implement its EMS; (6) The oversight mechanism that will be used to ensure overall program integrity as well as auditor objectivity and consistency; (7) The criteria in addition to the program elements that will be used to determine when a facility is failing to adequately implement its EMS, and the timing of corrective actions that must be taken (see Further Criteria for an Adequate EMS-Based Program above); and (8) The process by which a facility that has failed to take necessary corrective action will then be subject to applicable regulatory requirements and the time frame for accomplishing this based on the requirements listed above. States that choose to use ISO 14001 certification as the basis for evaluating a facility's EMS could use relevant ISO guidelines to address certain of these features.

EPA requests comments on the auditing program components described herein, as well as on the use of EMS in general in the CAFO program.

E. Three-Tier Alternative

In the proposed rulemaking, EPA proposed and discussed several alternative scenarios for structuring the NPDES regulation (66 FR 2996–3004). USDA has suggested that EPA consider an additional alternative that is a variant of the three-tier structure in which the middle-tier would include operations with 500 AU to 1,000 AU (rather than 300 AU to 1,000 AU). Thus, all facilities over 1,000 AU would be CAFOs based on size alone, those with 500 AU to 1,000 AU would be CAFOs if they met certain conditions, and those with fewer than 500 AU would be CAFOs only if so designated by the permit authority.

Table 5–4 from Section 5 of today's NODA compares the percent of CAFOs to the percent of recoverable nutrients under various thresholds. USDA data indicate that approximately 85 percent of excess recoverable nutrients are located at CAFOs with 500 AU or greater, representing almost 13 percent of AFOs. An additional 8 percent of excess recoverable manure nutrients are located at facilities with 300 AU to 500 AU, representing an additional 8 percent of facilities. USDA suggests that adopting a middle-tier category of 500 AU to 1,000 AU would focus regulatory efforts in areas where excess manure is more prevalent while avoiding imposing regulatory burden on large numbers of smaller facilities. EPA believes that economic analyses for this alternative are subsumed in the array of analyses that were conducted for the various thresholds, scenarios, and options in the proposed rulemaking.

EPA is requesting comment on whether to adopt this alternative three-tier structure.

F. Technical Correction

EPA is correcting a typographic error at 66 FR 2999, second column, first full paragraph. At the end of this paragraph, in the clause that reads ''unless the recipient has complied with the requirements for off-site shipment of manure,'' the term ''recipient'' is incorrect and should be replaced with the term ''CAFO owner or operator.'' The corrected paragraph reads as follows:

The revised conditions for the middle tier would require the owner or operator to apply for an NPDES permit if the operation meets any of the following conditions and is therefore a CAFO: (1) There is direct contact of animals with waters of the U.S. at the facility; (2) there is insufficient storage and containment at the production area to prevent discharges from reaching waters of the U.S.; (3) there is evidence of a discharge from the production area in the last five years; (4) the production area is located within 100 feet of waters of the U.S.; (5) the operator does not have, or is not implementing, a Permit Nutrient Plan that meets EPA's minimum requirements; or (6) more

than twelve tons of manure is transported off-site to a single recipient annually, unless the CAFO owner or operator has complied with the requirements for off-site shipment of manure.

VIII. Request for Comments

A. Specific Solicitation of New Information and Clarification on the Proposed ELG Requirements

1. EPA solicits comment on the extent to which EPA needs to establish additional performance or design criteria in the effluent guidelines to address chronic events, as described in section IV.A of this notice.

2. EPA solicits comment on the alternative ground water assessments, performance standards for liners, and new cost data for the ground water option described in sections IV.B.1 and V.B.2.a of this notice.

3. EPA solicits comment on reasonable amounts of phosphorus banking that could be considered an acceptable nutrient management practice. EPA also solicits comment on whether banking practices should be limited to solids and slurries, or whether banking should be considered for all manure applications.

4. EPA further solicits additional data and information on the technical feasibility, costs, and benefits of its proposed zero discharge standards for the swine and poultry sectors.

B. Specific Solicitation of New Data and Information EPA Is Considering for Its Cost and Economics Model

1. EPA is soliciting comment on its intention to use USDA's revised estimates of the number of potential CAFOs and the total number of AFOs, as described in section V.A.1 of this notice. EPA is also requesting information on suggested approaches to evaluate recent industry trends and changes in the number of larger-sized operations since 1997.

2. EPA is soliciting comment on revised estimates by USDA on the amount of manure nutrient coverage by the different regulatory scenarios in the proposed CAFO regulation, as described in section V.A.2 of this notice.

3. EPA is soliciting comment on revised estimates of the number of small businesses that are CAFOs that would be subject to the proposed regulations, as described in section V.A.3 of this notice. These revised estimates reflect changes in the small business definitions for these sectors, as established by the Small Business Administration (SBA).

4. EPA solicits comment on an approach to conduct a supplemental analysis that would assess the combined additional cost to comply with the existing regulations in addition to the incremental costs of the proposed regulations. EPA also requests data and information in order to conduct this supplemental analysis, as described in section V.B.1(a) of this notice. This analysis would serve as a separate ancillary analysis to the Agency's rulemaking package.

5. EPA solicits comment on suggested data and an alternative approach to refine EPA's engineering cost models to estimate compliance costs to regulated CAFOs, as described in section V.A.1(b) of this notice. This approach is based on additional data and information received by USDA and an approach that is currently under development by USDA to estimate the costs to animal feeding operations to implement Comprehensive Nutrient Management Plans (CNMP). EPA's alternative approach would be based on the alternative approach to frequency factors that evaluates three different performance group scenarios: below average performers, average performers, and above average performers.

6. EPA solicits comment on alternative approaches that EPA is considering to refine its economic models to estimate financial impacts to regulated CAFOs, as described in section V.C.1 of this notice. The changes EPA is considering include: addition of assessment criteria to measure changes in profitability; evaluation of financial impacts using data specified at multiple businesses levels within a representative facility (both the farm and the enterprise level, where data are available); revision to the debt-to-asset test threshold value; inclusion of a debt feasibility test; and addition of supplemental analyses that take into consideration various cost-offsets, such as tax savings, income from manure sales, and cost share assistance.

7. EPA solicits comment on alternate data that the Agency received and/or obtained during the comment period for use in its analysis for the final rulemaking package, as described in section V.C.2 of this notice. These data include alternative financial data to depict conditions at cattle feeding and hog operations that were provided to EPA through public comment, as well as other available alternative financial data for some other sectors that EPA has obtained since proposal. Other data that EPA is considering include available market and financial data in order to extrapolate available financial data for a single year and obtain longer-term average representation of financial conditions, as well as available projections by FAPRI for use in depicting financial conditions over the 10-year analysis period.

C. Specific Solicitation of New Data and Information EPA Is Considering for Its Nutrient Loading and Benefits Model

1. EPA solicits comment on a proposal to utilize the BASINS case study method for the swine, dairy, beef, broiler, turkey, and layer sectors in addition to the GLEAMS analysis to provide additional information on modeling of pathogen loads, production area, and manure storage lagoon effects.

2. EPA solicits comment on approaches it is considering for the quantification and monetization of changes in air emissions resulting from the regulation, the appropriateness of these steps for the pollutants it is considering, and requests information on data and studies not included in the record that could be used for these analyses.

D. Specific Solicitation of New Information and Clarification for the Proposed NPDES Requirements

1. EPA requests comment on alternative size thresholds for ''dry lot'' duck operations. EPA is also soliciting more complete data concerning the number and size of wet lot and dry lot duck operations nationwide.

2. EPA requests comment on two new options for determining whether a horse operation is a CAFO and subject to NPDES permitting. To support evaluation of these options, the Agency requests that commenters supply data comparing the nutrient content of race horse manure with that of non-race horses. EPA also seeks complete data on the number of confined horse operations—including the number of horses confined—differentiating racetrack operations from non-racetrack operations.

3. EPA requests comment on whether to count cow/calf pairs in the beef sector as one animal, and if so, for what period of time offspring should be considered part of the cow/calf pair.

4. EPA seeks comment on alternatives—either those discussed in this notice or others—that could more explicitly allow states to implement well-developed non-NPDES state programs for middle-tier facilities. In particular, EPA seeks comment on: the appropriate level of federal oversight for such programs to provide assurance of protection of water quality; how a State could provide assurance that its program would continue to meet the criteria used to obtain program approval; the need for public comment prior to granting such flexibilities; the

validity of the criteria discussed in this notice for assessing whether a State non-NPDES program is sufficient for allowing flexibility; and what kind of performance measures, if any, EPA should consider requiring.

5. EPA solicits comment on the use of environmental management systems (EMS) in the CAFO regulations as a way to enhance state flexibility. In particular, EPA seeks comment on the following issues: comments on the three additional potential approaches discussed in this notice for incorporating EMS-based options in the CAFO regulations; for the first potential approach (modified permit requirements for facilities with more than 1,000 AU), which types of permit requirements it may be appropriate to amend; which standards a state EMS program would be required to meet to obtain EPA approval, and the process for obtaining EPA approval; the appropriate elements of a state EMS program, including the six elements discussed in this notice; screening criteria for determining an AFO's eligibility to implement an EMS in lieu of applying for a permit, as well as the timing of the screening; the frequency of follow-up self-auditing and third-party auditing of a facility's EMS; requiring independent third party audits for all facilities or alternative approaches such as random auditing, risk-based auditing, and/or self-certification of the EMS; the most appropriate method of sharing third-party audit results (including web site publication), the content of results shared, and the frequency with which results should be shared; the best approach, or combination of approaches, for reacting to and addressing EMS nonconformance; an appropriate time line for implementing the EMS-in-lieu-of-permitting requirements for participating facilities; and the existing costs of EMS implementation for AFOs, both per-facility and organization-wide; and requests any available information on the performance of EMSs in addressing regulated and unregulated environmental impacts.

6. EPA is requesting comment on an alternative three-tier structure, setting the middle-tier at 500 AU to 1,000 AU.

Dated: November 9, 2001.

G. Tracy Mehan III,

Assistant Administrator for Water.

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