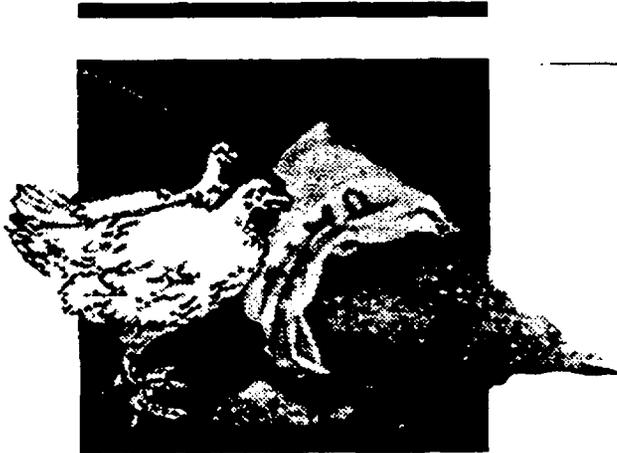


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 **The Report of the EPA/State
Feedlot Workgroup**



ACKNOWLEDGMENTS

This document represents the efforts of a number of people whose devotion to the protection of water quality and the management of animal waste is exemplary. Over a long period, they have been relied upon to contribute not only their time but also the unique perspective that they bring to bear on a National program conducted at a local level. Through their hard work and dedication to seeking creative solutions the Agency can move closer to a strategy for effecting change and encouraging excellence in environmental management in the livestock feeding industry. The research and analysis reported by the following subgroups should serve as a resource for Agency and State personnel. In addition, I am especially indebted to the efforts of Ruby Cooper, Paulette Johnsey, Gary Polvi, Stephen Sweeney, and Anne Weinberg in their efforts in drafting the reports and Jackie Hanson for her long hours and tireless efforts without which this document would not have been completed.

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FORWARD

After reviewing information from various sources that identified livestock feeding facilities as significant sources of water quality impairment, the Director of the Office of Wastewater Enforcement and Compliance (OWEC) formed an EPA/State Feedlot Workgroup in April 1992. The Workgroup's charge was to study issues related to the impact of feedlots on U.S. waters, and to develop strategies and guidance for reduction of feedlot pollution, utilizing tools available to the Agency under NPDES, Nonpoint Source, and Ground Water Protection Programs.

The Workgroup's membership includes representatives from four EPA Regions and nine Headquarters divisions, as well as six State environmental programs. A roster of the Workgroup membership follows this forward. Because the Workgroup has an agricultural focus, the Workgroup has sought and will continue to seek input from United States Department of Agriculture (USDA) staff. The Workgroup has also received input from the United States Fish and Wildlife Service (FWS).

The Workgroup has taken a total quality management (TQM) approach, encouraging participation by each member and utilizing the Focus, Analyze, Develop, Execute (FADE) approach to organizing this effort. A National meeting of the Workgroup in April 1992 was used for the Focus phase. During the meeting, the Workgroup determined that all feedlot-related issues could be placed into one of four categories: (1) determination of the magnitude and geographic extent of feedlot pollution; (2) feedlot permitting issues/strategies and development of a guidance document for Federal environmental laws affecting feedlots; (3) methods/strategies to verify that feedlots comply with water regulations; and (4) methods to increase voluntary compliance with water regulations and promote public involvement in reducing feedlot pollution. The Workgroup membership volunteered to staff four subgroups corresponding to these four categories. Each subgroup was led by representatives from EPA Headquarters and Regions or States.

The Feedlot Workgroup subgroups have completed the analysis phase of their projects. The four reports contained in this document are their findings and were used as the basis of the recommendations made in Draft Water Quality Strategy for Animal Feeding Operations (September 1993). It is hoped that this document will be used as a resource to enhance the understanding of feedlot-related issues and will provide information to Regions/States as they develop feedlot strategies.

As you read the document, you may notice variations in structure and format. This occurs because each subgroup used its unique approach to develop its own report before the reports were compiled in this document.

Summary of Report Findings

Several important findings emerged from the subgroup studies. Data indicate that animal waste impairs surface water uses at approximately the same level as other significant sources of water pollution such as storm sewers/runoff or combined sewer overflows. Even

though feedlots cause a significant number of water impairments, the Workgroup found that only a fraction of Concentrated Animal Feeding Operations (CAFOs) are covered by permits and that far fewer, still, receive compliance inspections. These findings may well be the result of noted confusion/inconsistency in the interpretation of Federal regulations for CAFOs from State to State. The Workgroup also found that the feedlot industry is distinguished from other types of industries in its tendency to be cooperative rather than competitive. For this reason, it is believed that education/outreach activities on the part of EPA and the States would be especially fruitful in attaining greater compliance.

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**WATER POLLUTION FROM FEEDLOT WASTE:
AN ANALYSIS OF ITS MAGNITUDE AND
GEOGRAPHIC DISTRIBUTION**

February 1993

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**WATER POLLUTION FROM FEEDLOT WASTE: AN ANALYSIS OF ITS
MAGNITUDE AND GEOGRAPHIC DISTRIBUTION**

I. PURPOSE

This paper was prepared at the request of the Director for the Office of Wastewater Enforcement and Compliance to inform management at the United States Environmental Protection Agency (EPA) of the extent of water pollution from waste generated at both small and large feedlots. This paper is intended to be an internal resource for EPA management to use as an aid in making program decisions.

The Agency presently faces significant resource demands to control water pollution problems from several sources. Therefore, to assist in providing a basis for program priorities, this paper compares the magnitude of water pollution caused by livestock¹ waste with other nationally significant water pollution sources, such as storm water and combined sewer overflows (CSOs). This paper is not intended to provide strict risk assessment of various sources of water pollution: since the necessary data are unavailable, this paper does not assess the total population affected by each source, nor does it quantify the amount or effect of pollutant loadings from these sources. Rather, the paper compares pollution sources on the basis of the total amount of waters not meeting designated uses because of pollutants from various sources.

This paper also describes the geographic extent of both surface and ground water pollution from livestock waste and the human health, ecological, and economic implications of livestock waste pollution.

II. BACKGROUND

The Federal Water Pollution Control Act of 1972 (FWPCA) required that EPA regulate "concentrated animal feeding operations" (CAFOs). Although most animal feeding operations were traditionally considered to be nonpoint sources of pollution, Congress defined CAFOs as point sources in the FWPCA. EPA thus established regulations under the National Pollutant Discharge Elimination System (NPDES) permit program which require permits for CAFOs that discharge to waters of the U.S. at times other than the event of a 25-year/24-hour storm, and that (1) have more than 1,000 animal units (AUs)² or (2) have more than 300 AUs and discharge directly to waters of the United States.

¹ Livestock, for the purposes of this paper, is defined as cattle, swine, horses, and poultry.

² 1,000 AUs equal 1,000 slaughter and feeder cattle; 700 mature dairy cattle; 2,500 swine, each weighing more than 25 kilograms; 500 horses; 10,000 sheep or lambs; 55,000 turkeys; 100,000 layers or broilers if the facility has continuous overflow watering; or 30,000 layers or broilers if the facility has a liquid manure handling system. 300 AUs equal 300 slaughter or feeder cattle; 200 mature dairy cattle; 750 swine, each weighing more than 25 kilograms; 150 horses; 3,000 sheep or lambs; 16,500 turkeys; 30,000 layers or broilers if the facility has continuous overflow watering; or 9,000 layers or broilers if the facility has a liquid manure handling system.

Facilities in both categories are subject to penalties for any discharge to a water of the U.S. without a permit. Facilities in the first category shall not discharge to waters of the U.S. except in the event of a 25-year/24-hour storm. In addition, any facility may be required to obtain a permit if the NPDES permitting authority determines that the facility contributes significantly to pollution of a surface water. Permit conditions necessary to protect surface water quality may be included in any permit.

In this report, the term "CAFO" will be used to indicate any livestock or poultry facility that meets the NPDES criteria. The term "feedlot" will be used to refer to CAFOs as well as any other animal feeding operation.

A. Size And Geographic Distribution Of Livestock Operations

Table 1 gives information on the industry profiles for various types of livestock operations in the United States. This table gives estimates of the total number of farms, the total animal inventory on these farms, the number of these farms housing 1,000 or more animal units, and the percentage of each type of livestock housed in facilities having more than 1,000 animal units (1,2). Table 1 shows that the percentage of animals kept in operations holding more than 1,000 animal units ranges from 8 percent of dairy cows to 80 percent of fed beef cattle. For cattle, the industry profiles only include data for fed cattle operations; range and pasture cattle operations, where manure is deposited in a diffuse manner such that manure nutrients can be assimilated by plants and therefore in general do not threaten water quality; are excluded. However, all poultry, swine, and dairy operations are included in the profiles because poultry and swine facilities nearly always meet the definition of an animal feeding operation (40 CFR 122.23) and most dairy operations either meet that definition or have animal holding areas where manure is deposited in a concentrated manner such that improperly managed manure may present a threat to water quality.

Table 1. Estimated Number of Farms and Animal Inventory by Livestock Category in the U.S.

Livestock Category	Total Number of Farms	Total U.S. Animal Inventory	Number of Farms with >1000 AUs	Percentage of Inventory on Farms with >1000 AUs
Beef feedlot	190,000	14,000,000	1,700	80
Dairies	202,000	10,085,000	780	8
Layers	142,000	316,503,000	560	50
Broilers	27,600	766,486,000	520	50
Swine	243,400	52,217,000	2,400	20

Figures 1, 2, 3, and 4 show the distribution of the various types of livestock across the United States as published in the Census of Agriculture (1987) (3).

Figure 1

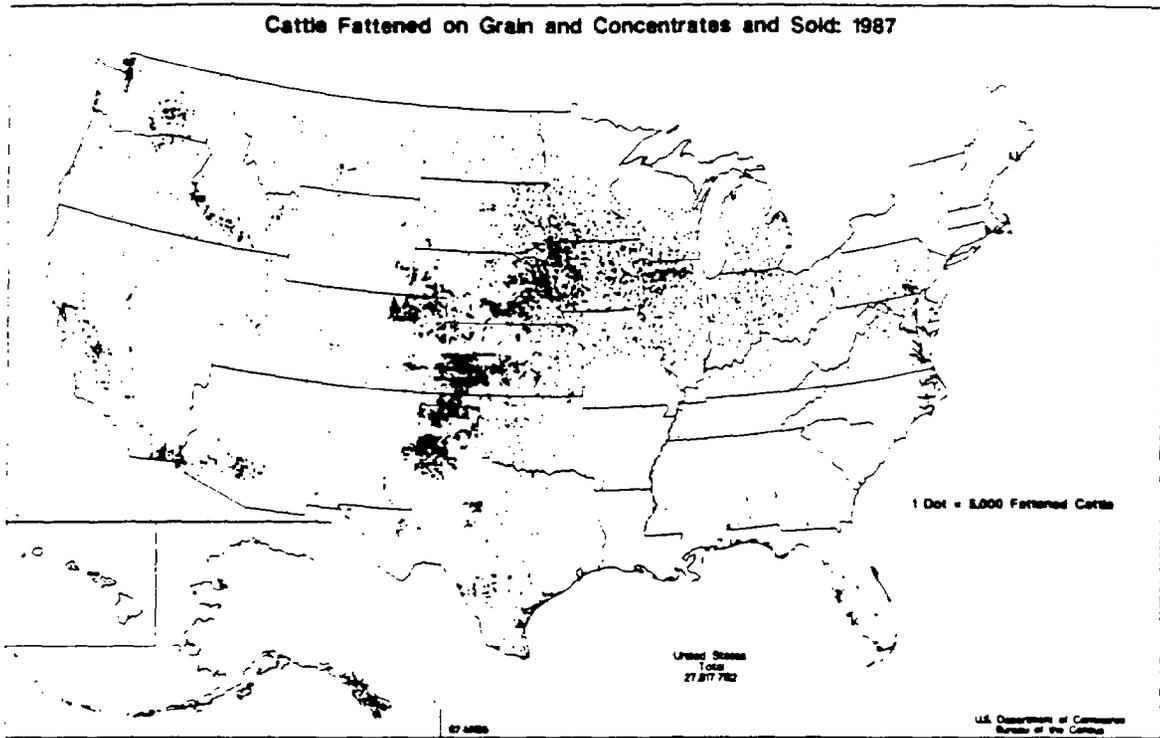


Figure 2

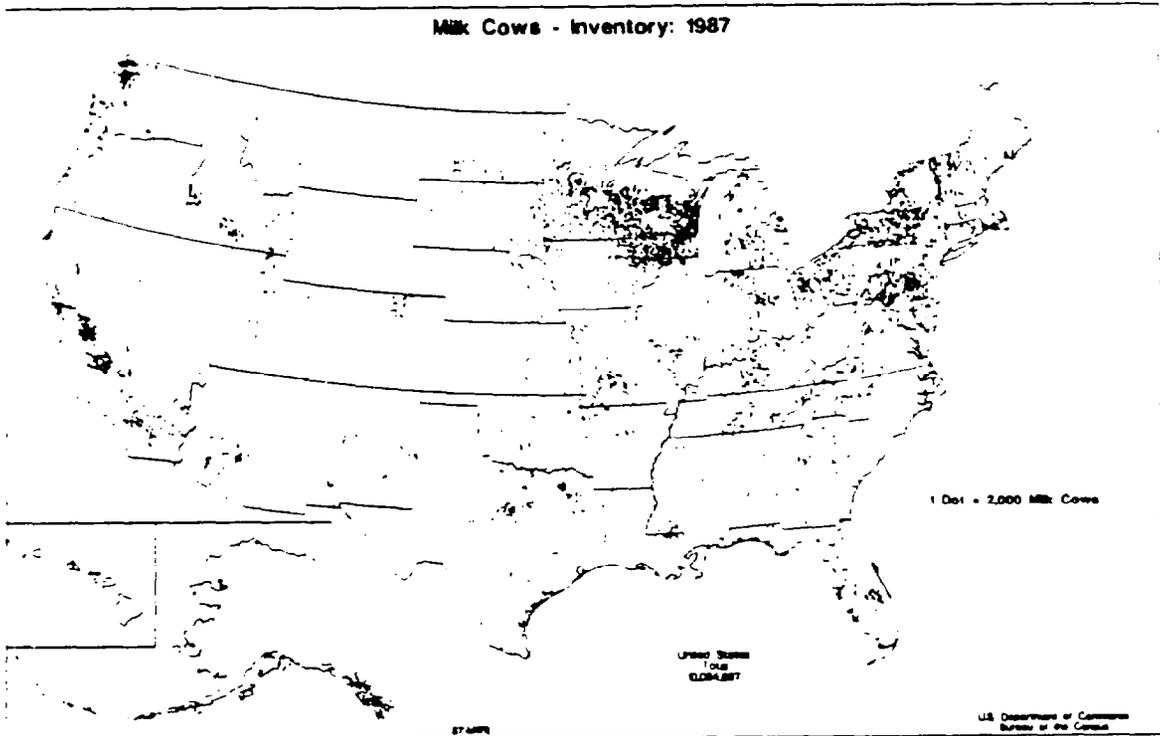


Figure 3

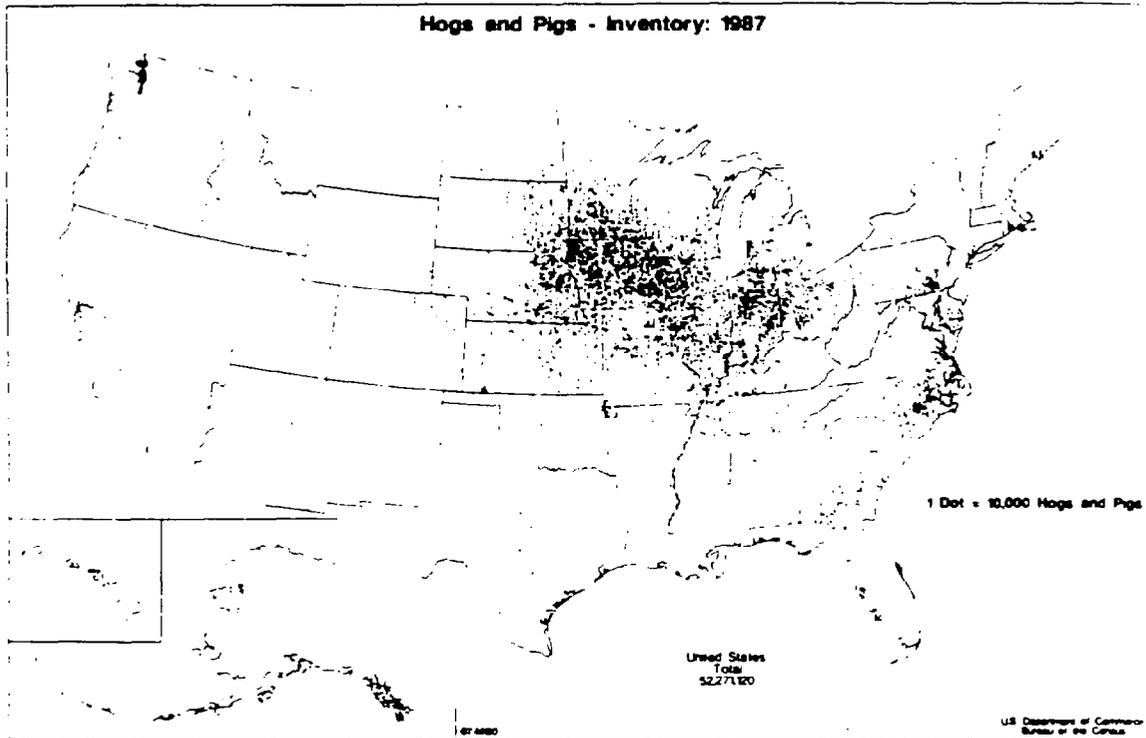
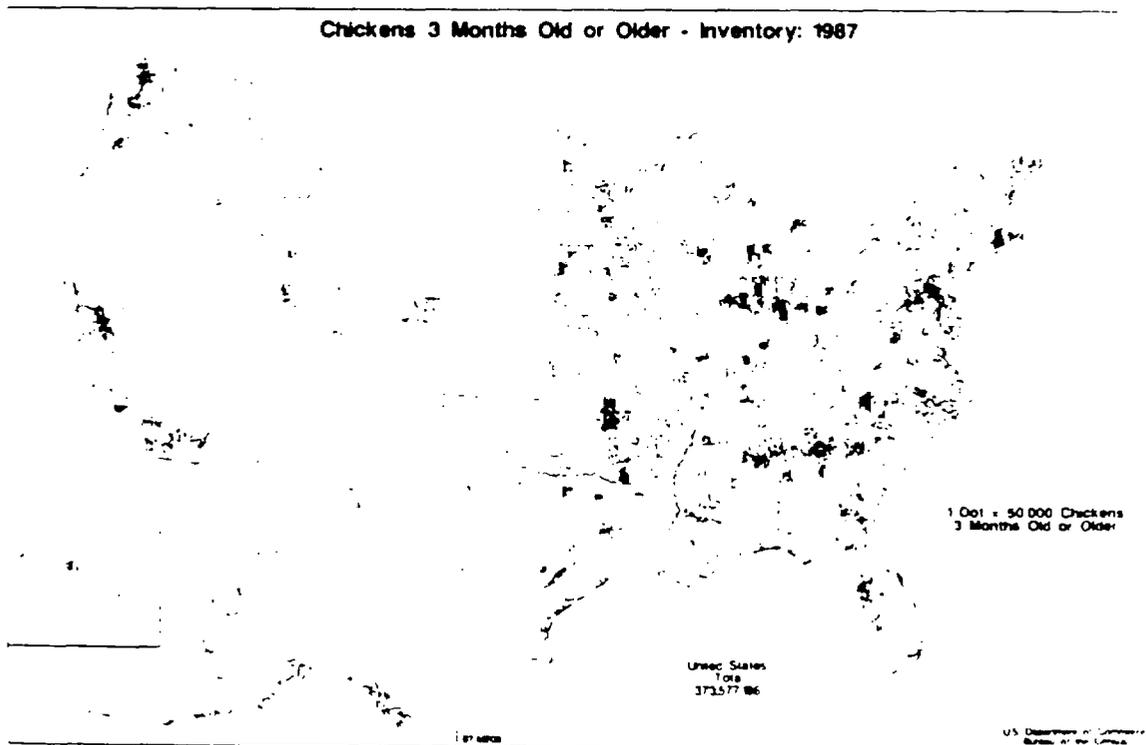


Figure 4



B. Livestock Operations Requiring NPDES Permits

EPA's Permit Compliance System (PCS) database indicates that EPA's Regional offices and States with approved NPDES programs have issued individual permits covering 1,051 CAFOs and five general permits covering at least another 123 facilities. The total number of NPDES permits for feedlots is significantly less than the approximately 6,000 facilities (see Table 1) that have more than 1,000 animal units. The discrepancy between the number of facilities with NPDES permits and the total number of feedlots over 1,000 animal units is believed to be due to the following factors: (1) feedlots may be covered by non-NPDES State permits, which are not reported in PCS; (2) because of limited State and Federal resources, some feedlots that should have a permit have not been brought into a regulatory program; (3) some regulatory authorities misinterpret the Federal regulations for CAFOs and mistakenly exempt facilities that should have permits; and (4) permits are required for only those facilities that discharge at times other than the event of a 25-year/24-hour storm.

To increase permit coverage of CAFOs, some States (including Oregon, Montana, and Washington) have issued general permits for CAFOs. In addition, EPA Regions 8, 9, and 10 have, respectively, issued general permits for CAFOs in South Dakota, Arizona, and Idaho (these States have not been delegated NPDES authority in these Regions). Region 6 has very recently issued general permits for CAFOs in Texas, New Mexico, Oklahoma, and Louisiana. The Region estimates that more than 1,000 facilities will be covered under the new general permit. Some of these general permits have requirements (such as retention pond liner specifications or monitoring of discharge) in addition to the requirements given in the effluent guidelines for CAFOs.

The United States Department of Agriculture (~~USDA~~) has estimated that there are ~~approximately 200,000~~ animal feeding operations with less than ~~200~~ animal units but more than 20 animal units (4). While most of these operations are not subject to NPDES regulations, many have been regulated by State regulatory programs.

Data recently collected pursuant to Clean Water Act (CWA) sections 319 and 305(b) indicate significant pollution problems caused by feedlots and animal holding areas. Data also indicate significant impairments caused by pasture and range operations but those impairments will not be included here. However, no conclusive evidence currently indicates the relative water quality impacts caused by small versus large or regulated (permitted) versus nonregulated (nonpermitted) feedlots.

III. DATA SOURCES

The major data sources used in this paper include the 1989 CWA section 319 Report to Congress, entitled *Managing Nonpoint Source Pollution*, and the 1990 CWA section 305(b) report, entitled *National Water Quality Inventory: 1990 Report to Congress*. After evaluating a number of references for data quality, consistency, and comprehensiveness, the subgroup has determined that these two data sources give the best data on the extent of feedlot pollution and allow comparison between feedlots and other pollution sources.

Supplemental information was obtained from computerized literature searches of the Aquatic Sciences and Fisheries Abstracts, and the Water Resources Abstracts Volume 1. Also

reviewed were relevant reports prepared in connection with the National Estuary Program, the Clean Lakes Program, the Chesapeake Bay Program, the Rural Clean Water Program, and the Global Climate Change Program.

IV. GEOGRAPHIC EXTENT OF WATER POLLUTION

A. Surface Water Pollution

1. National Data and Comparison of Feedlots and Other Nationally Significant Water Pollution Problems: Subgroup Analysis Using Section 305(b) and 319 Data

This subgroup's analysis of the most recent summary data collected pursuant to sections 305(b) and 319 of the ~~CWA~~ **indicates that feedlots nationally cause or contribute to 7 percent of impairments** (i.e., cause non-support or partial support of designated water uses) in lakes and 13 percent of impairments in rivers (6, 7).³ When overall levels of water-use impairment are figured in, feedlots are found to impair approximately 1 percent of assessed lakes and 3 percent of assessed rivers.

In addition to the results of this analysis, the Waterbody System, a database currently used by 39 States to store waterbody-specific data on water ~~pollution impacts~~, **indicates that 1,785 waterbodies are impaired by feedlots in these States.** Also, in 1984, the U.S. Fish and Wildlife Service estimated that feedlots impair fisheries in ~~about 60,000 miles of streams nationally~~ **(8).** ~~Fishery impairment standards of the U.S. Fish and Wildlife Service (FWS) are likely to be higher standards than State-designated water use standards for some portion of our Nation's streams).~~

We believe that our estimates of the extent of water use impairment in lakes and rivers are reasonable and conservative, reflective of the effects animal waste has on waters of the U.S. However, it should be noted that the accuracy of the figures provided by our analysis cannot be determined.

a. Data Limitations.

The national data used in our analysis are imprecise: some States do not disaggregate agricultural sources of pollution into more specific source categories such as feedlots or

³ The method used to analyze the magnitude and geographic concentration of feedlot pollution is described in Appendix A. The data used in the analysis come from the *National Water Quality Inventory: 1990 Report to Congress and Managing Nonpoint Source Pollution: Report to Congress on Section 319 of the CWA (1989)*.

irrigated crops,⁴ not all waters of the United States were assessed, some States did not provide data for the most recent section 305(b) and section 319 summary reports,⁵ a few States reported data for their lakes or rivers but not both and some States may have excluded water impairments caused by CAFOs (point sources) in their section 319 (nonpoint source) reports.⁶ Furthermore, there are known water quality impairments caused by animal waste from feedlots in some States that do not report any feedlot-specific data in the section 319 summary report. Some of these impairments are noted in the site-specific examples given later in this paper, and some of these impairments are noted in the descriptive parts of the States' 305(b) or 319 reports but are not accounted for in the States' tabulated summary data. It is possible that these States are reporting feedlot impairments in the nonspecified agriculture category, rather than in the feedlot category.

b. Analytical Methodology Limitations.

In addition to the data limitations, there are analytical methodology limitations. Because we use specified⁷ agriculture impacts as a representative sample for all agricultural impacts, our method will overestimate feedlot impairments in any geographic area that attributed some impairments to feedlots and the remaining nonfeedlot agriculture impairments to the unspecified agriculture category.

Because of data and methodology limitations, the absolute extent of feedlot impacts may be different from that indicated by our analysis. However, most of the sources of data imprecision that affect analysis of feedlot data also affect section 305(b) data for other pollution sources such as CSOs or separate storm sewers. Therefore, it is thought that a relative comparison of data for feedlots with data for other sources is still a reasonable means to determine whether feedlots cause approximately the same amount of impairments as other sources that are considered significant.

Table 2 shows that feedlot impairments, as analyzed by our methods, are comparable in magnitude to impairments from other nationally significant sources that are acknowledged as serious. Our estimates show that feedlots impair more river miles than CSOs, storm sewers,

⁴ States that did not disaggregate agricultural sources of pollution are Connecticut, Maine, Massachusetts, Delaware, Maryland, Pennsylvania, Virginia, Kentucky, Oklahoma, New Mexico, Iowa, Utah, and Idaho. Missouri and South Dakota disaggregate only feedlot sources of pollution; all other agricultural sources of pollution are reported as aggregate.

⁵ States that did not provide usable summary data for this analysis in the section 305(b) or section 319 summary reports are New Hampshire, New Jersey, Florida, Mississippi, South Carolina, Michigan, Minnesota, Oklahoma, Nebraska, Colorado, Alaska, Idaho, and Oregon.

⁶ States reporting data for lakes or rivers but not both for either the section 305(b) or section 319 summary report are Alabama, Arizona, Arkansas, Delaware, Kansas, Kentucky, Louisiana, Massachusetts, Mississippi, Nebraska, North Carolina, North Dakota, Ohio, Pennsylvania, Vermont, Virginia, and West Virginia.

⁷ Specified agriculture categories are irrigated crops, nonirrigated crops, specialty crops, aquaculture, feedlots, rangeland, pasture, animal holding areas, and streambank erosion. States may also choose to attribute impacts to unspecified agriculture.

or industry, and are a significant source of pollution in lakes. Feedlot impact is indicated to be less significant, on the average, in estuaries and ocean coasts—although there are estuaries, such as the Chesapeake Bay and Puget Sound, where animal waste pollution is a significant problem. Wetlands impairments are not listed in Table 2 because the wetlands data reported in the section 305(b) summary report are based on an extremely limited sample.

Table 2. Percentage of Impaired U.S. Waters in Which Various Sources of Pollution Contributed to Impairment and Percentage of Assessed Waters Impaired

Type of Waterbody	Feedlot Source **	CSOs Source *	Storm Sewers Source *	Industry Source *	Percent Assessed Waters That Are Impaired*
Rivers	13	2	11	9	30
Lakes	7	0.1	28	9	40
Estuaries	3	6	30	10	33
Great Lakes	0	46	0	3	97
Coasts	0	4	36	15	10

* Data taken from *National Water Quality Inventory: 1990 Report to Congress*.

** Analysis performed by feedlot workgroup, using method described in Appendix B.

The data indicate that feedlot impairments are not evenly distributed across the Nation. Factors that contribute to the uneven distribution of feedlot pollution include variations in: site sensitivity, feedlot density, and regulatory or voluntary control of feedlot wastes. The uneven distribution of feedlot impairments is also partially due to differences in water quality standards, as well as differences in the averaged level of designated uses of feedlot-polluted waters, from State to State. State examples illustrating the variation in factors that contribute to feedlot pollution problems are given below.

The State of Wisconsin reports a higher than average rate of impairments caused by feedlots. It should be noted that Wisconsin has an active regulatory program for feedlots, and also has well-developed nonpoint source and water monitoring programs. However, although Wisconsin has a progressive program, it also has a very large number of small dairy farms, sited along streams, which significantly contribute to the State's water quality problems.

The following observations were made on the section 319 data provided for the 13 States that have the highest fed cattle inventory in the Nation: no data at all are reported for Nebraska, there are no disaggregation of agriculture sources for Iowa or Idaho, and there is little disaggregation for Oklahoma. No feedlot impacts are recorded for Arizona, Colorado, Kansas, or Minnesota. Feedlot data are provided for California, Illinois, South Dakota, Texas, and Washington. Using the subgroup's method of analysis on data from these States, we find that feedlots are reported to (1) cause 4 percent of impairments in lakes and 6 percent of impairments in rivers—about half of the national averages and (2) impair 1 percent of assessed lakes and 4 percent of assessed rivers—which is the same as the national average for lakes and greater than the national average of 3 percent for rivers. It is possible that factors such as drier weather patterns or better manure management in these States help

keep the level of feedlot impairments near the national average, even though these States have high livestock production.

2. Manure Surplus Method of Analysis

Other methods of estimating the distribution of feedlot pollution do not involve use of section 305(b) or section 319 data. One method is to determine where manure nutrient production exceeds crop nutrient assimilation. Since it is cost-prohibitive to transport most types of manure over long distances, a local overabundance of manure is a reasonable predictor of water impairments caused by feedlots. This method indicates which areas of the country would be more likely to have water quality impairments caused by animal waste even if there were no direct discharges of animal waste to waters of the United States.

A map showing (for each county) the pounds of economically recoverable phosphorus (from manure deposited in a concentrated manner and therefore easy to collect and utilize) in animal waste per acre of harvested non-nitrogen fixing crops is shown in Figure 5 (9). Some counties would have excess recoverable phosphorus even if all cropland were planted in phosphorus-intensive crops. Counties planted in crops that require relatively little phosphorus would also be prone to pollution from phosphorus-contaminated runoff. This study did not consider factors such as manure or nutrient management practices, the nutrient needs of the crops actually grown, soil types, proximity to surface waters, or topography, which all affect the likelihood that water quality impacts will occur. These results were obtained under the direction of EPA's Office of Policy, Planning, and Evaluation (OPPE), Water Policy Branch. This study averages the manure nutrients available to all fields in a county; however, in any county, certain fields may receive excessive amounts of manure and thereby threaten water quality, while other fields may receive much less manure.

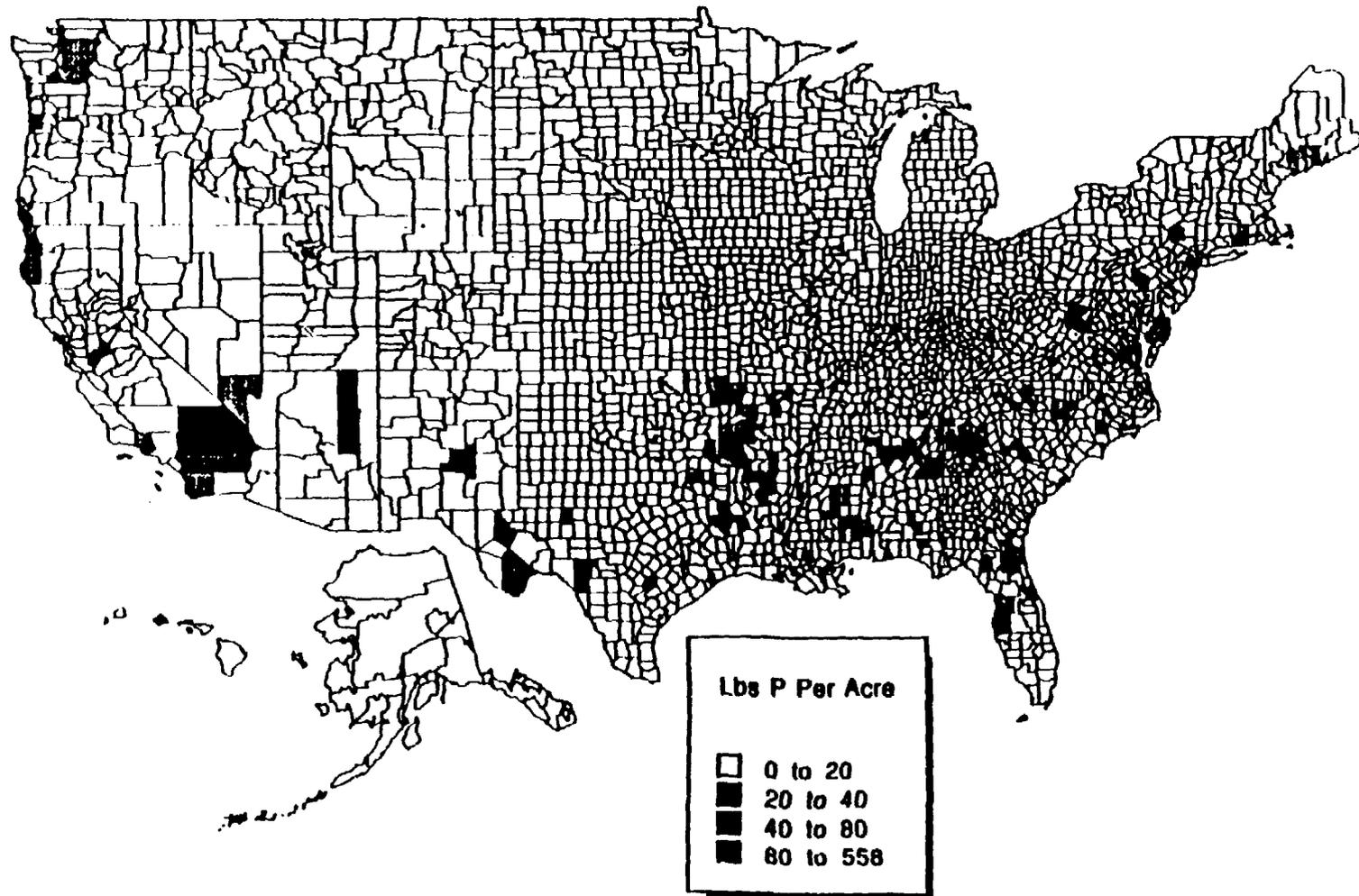
Recent surveys have indicated that, at least in some localities, few farmers follow recommendations to reduce fertilizer rates on crops following manure application or legume rotations (10). When soil nitrogen inputs from these sources are not accounted for, the excess nitrate can leach into ground water or enter surface water in runoff.

Phosphorus contamination also results from improper management of manure nutrients. The map in Figure 5 was based on phosphorus rather than nitrogen because the N:P crop uptake ratio is greater than the N:P ratio available from manure, and phosphorus residues will accumulate in the soil when beneficial use of manure is not phosphorus-limited (11). Erosion of phosphorus-contaminated soil can cause surface water quality impairments.

3. Animal Unit Density Versus Surface Water Coverage Method of Analysis

Another analysis that can help determine where feedlots are likely to cause surface water quality impacts has been conducted by the Assessment and Watershed Protection Division of the Office of Wetlands, Oceans, and Watersheds (12). This analysis indicates the difficulty of preventing discharge of animal wastes in each county or State, and it is based on

**Figure 5
Waste per Acre of Harvested Cropland in 1987**



Estimates by the Bruce Company - based on the 1987 Census of Agriculture data and
USDA and MWPS phosphorous production and recovery coefficients.
Warning: Acreage and animal population data values withheld in Census for some counties.

the premise that water quality impacts are more likely to occur in areas that have a larger source of pollutants and in which the pollutants have greater proximity to surface water.

In this analysis, animal unit density (all animal units in a geographic area (county or State) divided by the total land area) was multiplied by "surface water density" (i.e., the fraction of a geographic land area that is covered by surface water). Each geographic area was then assigned a pollution susceptibility ranking from 0 to 3 based on the quartile values of the resultant products of multiplication. The results are given in Figure 6 (12).

This analysis does include all animal units, regardless of whether they are housed at CAFOs or smaller feedlots or are kept on range or pasture. This analysis does not consider movement of pollutants through soil to ground water that is connected to surface water. This analysis identifies high pollution potential in two areas, the Chino Basin, California, and Lake Okeechobee, Florida, which have become widely known for feedlot pollution problems.

For most States, the results of the manure surplus and animal density versus surface water coverage analyses generally agree with the analysis of section 305(b)/319 data on feedlot impairments. The former two analyses may be useful to help determine the likelihood that feedlot pollution is occurring in states that did not provide 305(b) or 319 data.

While the analytical methods developed in this report are useful, none of them are perfect in identifying which areas will have animal waste pollution problems and which areas will not. Therefore, wherever feedlots are present, several steps must be taken to minimize the potential water pollution impact of animal wastes: (1) discharge of animal wastes must be minimized—wastes must be stored in an environmentally sound manner until they can be beneficially used; (2) manure nutrient management must be considered as part of an overall nutrient management plan; and (3) erosion of nutrient-containing soil must be minimized.

4. Site-Specific Studies

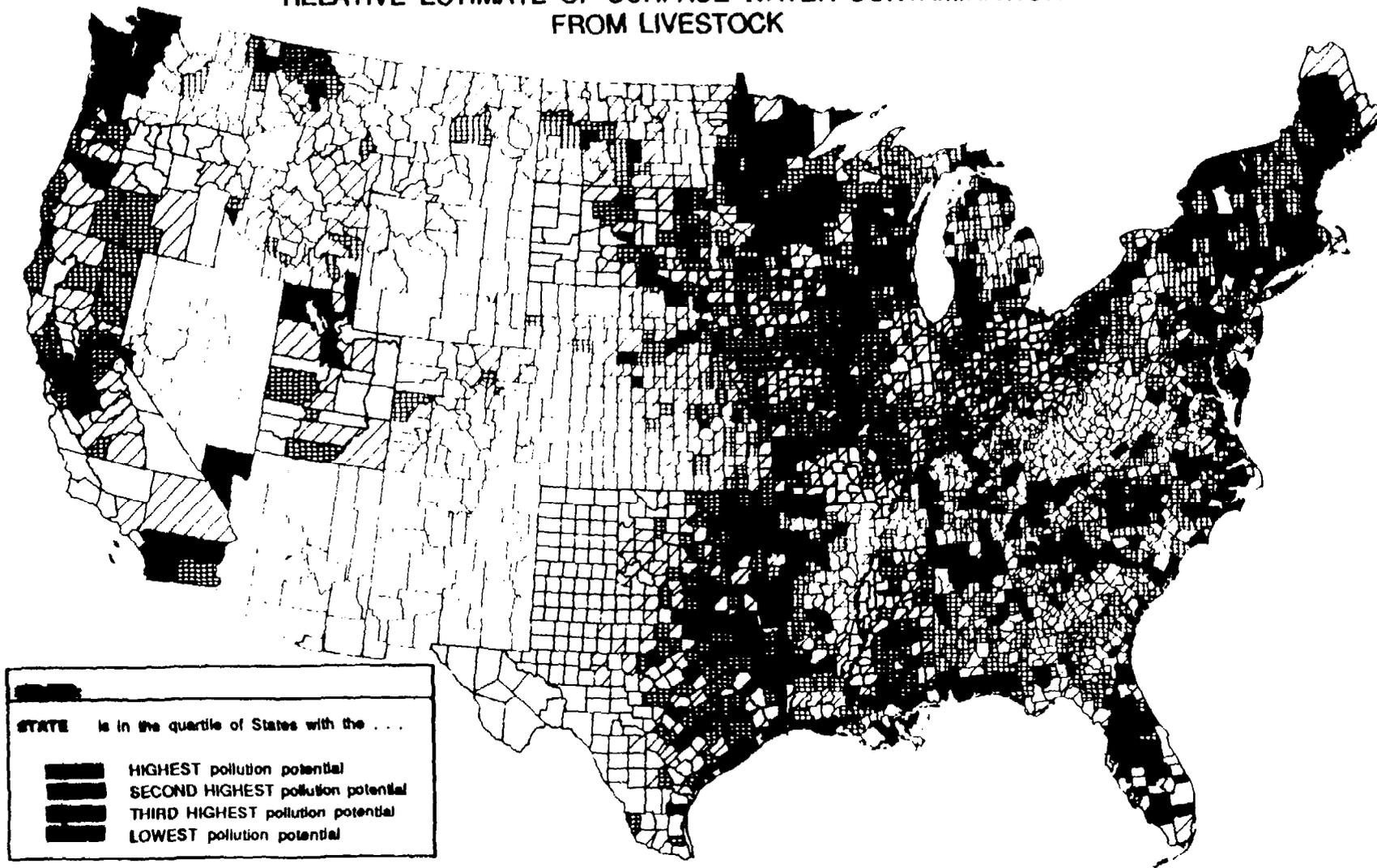
Details of several site-specific studies of surface water contamination caused by feedlots are described below. Some of the pollution problems listed below are being actively abated. These examples are provided as background information for managers who are not familiar with the nature of water impairments caused by animal waste. These examples are also provided so that managers who become involved in future efforts to reduce feedlot pollution will know where to seek advice from public officials or other persons involved in finding solutions to animal waste pollution.

Note that this report covers examples of impairments caused by feedlots in States that provide no feedlot-specific data in the most recent section 319 summary report. It is hoped that States will be able to provide more specific data in future section 305(b) and 319 reporting cycles.

However, wherever feedlot pollution occurs, the impact can be immediate and severe. Table 3 compares the concentrations of pollutants found in feedlot waste with those from CSOs and publicly owned treatment works (POTWs).

Figure 6

LIVESTOCK WATER POLLUTION POTENTIAL
RELATIVE ESTIMATE OF SURFACE WATER CONTAMINATION
FROM LIVESTOCK



STATE is in the quartile of States with the . . .

-  HIGHEST pollution potential
-  SECOND HIGHEST pollution potential
-  THIRD HIGHEST pollution potential
-  LOWEST pollution potential

SHADINGS:

COUNTY is in the quartile of counties with the . . .

-  HIGHEST pollution potential
-  SECOND HIGHEST pollution potential
-  THIRD HIGHEST pollution potential
-  LOWEST pollution potential

**COLOR ORIGINAL;
REPRODUCE THIS MAP ON
A COLOR PHOTOCOPIER**

Table 3. Concentrations of Selected Pollutants in CSO Effluent, POTW Effluent, and Livestock Wastes (mg/l) (13, 14)

Pollutant Source	TSS	Total Nitrogen	Total Phosphorus	BOD
CSO	374	8	5	71
POTW	22	20	6	19
Swine Effluent	9,000	1,200	400	2,500
Dairy Runoff	no data	150	80	1,500
Milking Waste	2,380	446	60	3,870
Beef Runoff*	6,000	1,100	110	3,200

* Runoff from a paved lot

Southeastern Pennsylvania: Agriculture impacts in Pennsylvania are not disaggregated in the summary section 319 report; any feedlot impairments might be attributed to unspecified agriculture rather than to the more specific source of feedlots. However, the Pequea and Mill Creeks watershed in southeastern Pennsylvania has experienced widespread surface water pollution from agriculture, primarily from livestock production. Some portion of this production occurs on feedlots. In this watershed, State researchers identified 58.5 miles of streams that have been degraded by agricultural nonpoint sources. In 1986, researchers detected nitrate-N levels above 10 mg/l (the national drinking water standard) in 43 percent of water samples in Pequea Creek. They also found ammonia concentrations at levels acutely toxic to aquatic life (3.8 mg/l) in both the storm and base flow of Pequea Creek (15).

Lake Okeechobee, Florida: No data from the State of Florida were included in the 1989 section 319 summary report. However, one of the largest and most severe algal blooms ever recorded in Lake Okeechobee occurred in the summer of 1986. Blue green algae spread across more than 120 square miles of the lake surface. Lake Okeechobee is the second largest lake entirely within the boundaries of the U.S. and serves as a drinking water supply for millions of people. Additional significant algae blooms occurred again in the fall of both 1986 and 1987.

In attempting to explain why these intense blooms occurred, researchers reviewed U.S. Geological Survey (USGS) and State water quality data collected over the previous decade. These data indicate a steady increase in the phosphorus concentration in the lake. The researchers noted that most of the phosphorus entering the lake comes from discharges from dairy and beef operations adjacent to the lake. There are roughly 75,000 head of beef cattle and 45,000 head of dairy cattle in Okeechobee County.

More important, researchers found a significant downward trend in the ratio of total nitrogen to total phosphorus, which could indicate a "shift in species composition from the lake's normal algal flora to less desirable N fixing blue green algae." If these trends continue, researchers suggest that eutrophication will accelerate and, ultimately, the lake's fishery resources will be severely damaged (16).

Lake Ponchartrain, Louisiana: No water quality impacts attributed to feedlots are recorded for Louisiana lakes in the most recent section 319 summary report. However, this major lake,

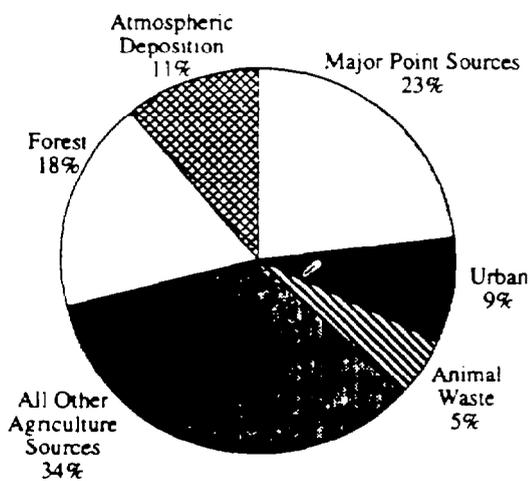
which is located near New Orleans, is considered to be "no longer suitable for swimming or fishing within about a half mile of most of the shoreline and the more than 4 million people living in the lake basin are unable to use it safely for recreation." The lake's southern shores have been closed to swimming since 1985 because bacteria levels exceeded safe levels by two orders of magnitude. Livestock operations are one of the major sources of pollution to Lake Ponchartrain (17).

The Clean Lakes Program: No feedlot-specific impairments are listed for Kansas in the section 319 summary report. However, regional EPA staff report water pollution problems from animal feeding operations in Lone Star Lake, Kansas; Herington Reservoir, Kansas; and Lamar Lake, Missouri. Each of these pollution problems was reported in 1992 (18). Because of Kansas permit program action, wastewater controls have now been installed at Lone Star Lake.

Chesapeake Bay Model Results: The graphs in Figure 7 indicate preliminary Chesapeake Bay watershed model results. The graphs give the percentages of the total N and P loaded into the Bay by different sources. The figures show that for the Bay, animal waste impacts are comparable in magnitude to urban (storm sewers/runoff) impacts. These two pollution sources were also found to be of comparable magnitude on a national basis, as was illustrated in Table 2. In addition, animal waste represents 34 percent and 20 percent of the controllable agricultural NPS phosphorus and nitrogen in the Basin. Furthermore, in the more seriously polluted portions of the Bay (the northern Bay areas), animal waste causes an even greater percentage of the pollution problem. The areas with the greatest concentration of animals include the Eastern Shore of Maryland and the Susquehanna, Potomac, Rappahannock, and James River Basins (19). No feedlot-specific impairments are recorded in the section 319 reports for Maryland, Delaware, or Pennsylvania, although rivers in these States largely drain into the Chesapeake.

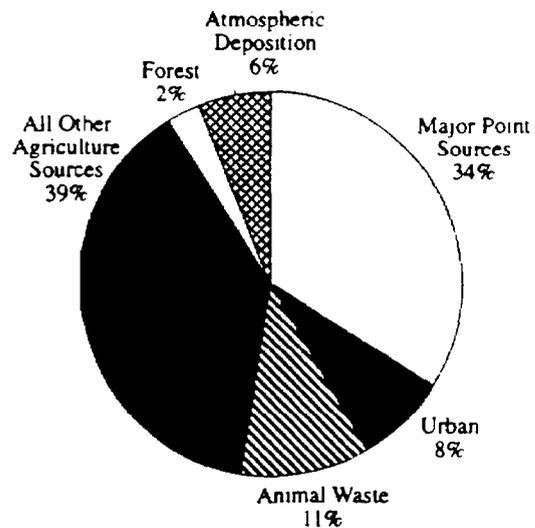
Figure 7

Sources of Nitrogen Entering the Chesapeake Bay



Total N Entering Bay: 377 Million lbs./yr.

Sources of Phosphorus Entering the Chesapeake Bay



Total P Entering Bay: 27 Million lbs./yr.

National Estuary Program (NEP) Results: Intensive studies conducted by the Washington Department of Ecology on commercial shellfish beds have implicated environmentally unsound animal-keeping practices by small part-time farms for the bacterial contamination that has closed a number of shellfishing areas in recent years (20).

Lake Merhl, Maryland: No water quality impairments caused by feedlots are noted for the State of Maryland in the most recent section 319 report. Water quality officials found that a single dairy caused severe water pollution in this 10-acre lake which drains a 345-acre watershed in Frederick County, Maryland. Officials found that waste management practices from the 100-head dairy need improvement in order to allow swimming in the lake. The primary concern is high bacteria counts (21).

Little Black River Basin, Missouri: In a study of the Little Black River Basin in Missouri and Arkansas, the USGS in cooperation with the USDA-SCS identified livestock waste as the principal source of bacterial pollution in the basin. Concentrations of fecal coliform bacteria exceeding 200 colonies per 100 milliliters occurred in 12 percent to 30 percent of the samples (sample size was 131) collected throughout the Basin. In each case, the primary source of fecal contamination was livestock (22).

B. Groundwater Pollution

1. National Data

The States indicate that groundwater quality is generally high. However, nitrates, pathogens (including fecal coliform, fecal streptococci, and other coliform bacteria), and salts from manure have contaminated ground water in Alabama, Arkansas, California, Colorado, Delaware, Kentucky, Iowa, Maryland, Missouri, Nebraska, New Mexico, Ohio, Oregon, Pennsylvania, South Dakota, Texas, and Wisconsin and are a concern in other States with significant livestock production (23, 24, 25, 26, 27, 28, 29, 30, 31, 32, and 33). Sources include leaking storage lagoons and over-application of manure nutrients onto cropland. Nitrates move through most soil types, but microorganisms generally must move to ground water through macropores in unconsolidated materials and fractured aquifer systems rather than directly through the soil (34). Nitrates and pathogens both may enter ground water when contaminated surface drainage enters poorly constructed wells.

Livestock waste provides a potential source of high levels of nitrate in ground water in regions with high livestock density and sensitive hydrogeology. Although manure solids can effectively seal the unpaved floor of an active beef feedlot and thereby restrict nitrate movement, there are certain combinations of soil type and waste characteristics that are conducive to the out-migration of nitrate leachate (35). If the seal is disturbed, as it is when a feedlot is abandoned, seasonally emptied, or completely cleaned of manure, increased amounts of nitrate may be formed and may subsequently leach (36, 37). Moreover, improper application of animal wastes to land can lead to nitrate accumulation in soil and ground water pollution (38).

In addition, ground water can be a significant mechanism for carrying contamination to surface water. Nationally, about 40 percent of the average annual stream flow is from ground water.

and during dry periods, there are many areas where nearly all of the stream flow is sustained by ground water inflow. Pollutants can thus be transferred from ground water to surface water.

National Pesticides Survey: In 1990, EPA completed a National Pesticide Survey in which the presence of 127 pesticides, pesticide degradates, and nitrates in community water system wells and rural domestic drinking water wells was monitored. Nitrate was the contaminant most frequently detected in the survey. In general, the researchers who conducted the National Pesticides in Drinking Water Wells survey found a positive correlation between the nitrate concentration in public and private wells and the market value of livestock in the survey area (sample size of 1350 wells: 650 public wells and 700 private wells) (39). However, the survey did not indicate the relative contributions of nitrates made by livestock wastes versus other rural sources of nitrate contamination such as fertilizer runoff or septic system leakage.

2. Site-Specific Studies

Chino Basin, California: Nitrate contamination in the Basin presently affects local drinking water quality and is expected to have a major impact on the drinking water quality in densely populated Orange County, California, since water rising from the Basin is used to recharge the primary source of drinking water for Orange County residents. In 1986, the Soil Conservation Service of the USDA conducted a study to identify the role of dairy farming as it affects ground water contamination in the Chino Basin. The researchers found that the nitrate-N concentration in ground water rose from 6 mg/l to 16 mg/l between 1969 and 1986. Currently, only 60 percent of the area's wells meet acceptable nitrate levels, and dairy operations have been identified as the most significant source of this increase (40). The Metropolitan Water District of Southern California reported that the 1986 nitrate levels in pumped ground water averaged 23 mg/l, 40 mg/l, and 63 mg/l in the three subbasins that comprise the Chino Basin (41).

Inland Bays, Delaware: In 1986, Dr. William Ritter of the University of Delaware measured the level of nitrates in ground water that exceeded 100 mg/l in areas beneath several poultry houses. Several other researchers found nitrate concentrations exceeding 10 mg/l in over 20 percent of wells in southeastern Delaware and the Eastern Shore of Maryland (42). Delaware has numerous poultry houses that do not discharge and therefore are not subject to the NPDES program, but the "dry" manure can ultimately cause both ground and surface water pollution if there is runoff or leachate from uncovered stacks of manure.

Pequea and Mill Creek Watershed, Pennsylvania: In May 1991, a random sampling of 183 wells in this watershed revealed that 50 percent of wells had a nitrate concentration greater than 10 mg/l with the highest detection at 47 mg/l. Researchers believe the high levels of nitrate are related to the high animal density in Lancaster County, which is the highest density in the Nation (15).

Upper Conestoga River Basin, Pennsylvania: Forty percent of the wells sampled in the carbonate and agricultural areas of this basin had nitrate concentrations greater than 10 mg/l. Researchers concluded that nitrate occurrence in the area is closely associated with

agricultural practices. The livestock and poultry density in the area averages 2 animal units per acre (15)

Coastal Study in Maryland: USGS researchers examined nitrate levels in the coastal plain in Maryland and found that ground water at sites with agricultural land uses had the highest median nitrate levels. Moreover, the researchers found that sites with livestock had the highest median values in comparison to sites near other agricultural sources (39, 43).

Boone St. Joe Aquifer, Arkansas: Researchers examined this shallow aquifer to identify the extent to which agricultural production affects the levels of nitrates and other substances in ground water. Researchers found that the aquifer was particularly vulnerable to contamination from surface recharge through fractures and solution openings. Nitrate and chloride were consistently found at a significantly higher level under intensively farmed sites compared to samples taken beneath forested control sites. Although land use was the only major difference between sites, fecal coliform and fecal streptococci were significantly higher in the farmed sites than in the control sites. Correlation of nutrient levels with sodium and chloride concentrations suggests that the source of these contaminants is animal waste, which has been applied as fertilizer in the area (44).

V. NATURE OF IMPACTS FROM ANIMAL WASTE

A. Human Health Implications

At least two human health effects may result from livestock waste pollution. Each is discussed in more detail below.

1. Methemoglobinemia

Methemoglobinemia (MHG) is a potentially fatal condition that results when excessive hemoglobin is oxidized to methemoglobin and thereby loses its ability to carry oxygen. While nitrates do not directly oxidize hemoglobin, they can be converted by gastrointestinal microflora to nitrite, which can produce MHG. Infants have low concentrations of the blood enzyme that reduces methemoglobin, and are therefore at risk of experiencing methemoglobinemia when exposed to drinking water exceeding 10 mg/l nitrate-N.

Infant deaths resulting from MHG have occurred in the United States as recently as 1986, but the incidence of MHG has significantly decreased as residents of most areas with high water nitrate levels have been informed of the risks of MHG and have been advised to use bottled water for drinking purposes.

Little is known about possible non-fatal health effects of MHG in adults or children who ingest nitrates, or in fetuses or breast-fed infants whose mothers drink nitrate-contaminated water (45).

2. Acute Symptoms and Diseases from Exposure to Microorganisms

People of all ages can contract up to 150 diseases from the microorganisms in livestock waste through direct contact with contaminated water, consumption of contaminated drinking water, or consumption of contaminated shellfish. Illnesses include cryptosporidiosis, cholera, tuberculosis, typhoid fever, salmonella, and polio (24).

Shellfish bed closures due to exposure to coliform bacteria and other pathogens have occurred in Oregon, North Carolina, and Washington (23,20). Human consumption of contaminated shellfish can result in the adverse health effects discussed above.

B. Adverse Ecological Effects

Livestock waste can cause ecological disruptions to aquatic ecosystems (rivers, lakes, ponds, and estuaries) and wildlife populations and contributes to global warming.

1. Fishkills

Numerous fishkills caused by animal waste pollution have occurred in California, Florida, Indiana, Iowa, Nebraska, North Carolina, and Texas (23, 29, 30, 46, 47, 48, 49, 50, 51, 52). Fish and other aquatic organisms may die as a result of the toxic effects of ammonia, which is produced as manure decays (24), or they may suffocate because of insufficient oxygen levels caused by the oxygen-demanding decomposition of organic matter in the manure.

2. Changes in Water Habitat/Ecosystem

Livestock waste in water also releases nutrients such as nitrogen and phosphorus, which encourage the growth of algae. Once an algal bloom dies off, the algal mats require oxygen for decomposition. The reduced oxygen levels may result in a fishkill. Furthermore, rates of eutrophication accelerate when waterbodies accumulate the debris that results from the decay of algae. Floating algal mats may also prevent sunlight from reaching submerged aquatic vegetation (SAV), which serves as habitat for other organisms. The reduction in SAV in the Chesapeake Bay is the leading cause of the Bay's decline, adversely affecting both fish and shellfish populations (45, 53).

3. Wildlife Impacts

Bacteria in livestock waste cause avian botulism and avian cholera, killing thousands of migratory waterfowl annually (50). Metallic elements/ions in livestock waste such as zinc, copper, and strontium can contaminate both surface waters and sediments (50). In 1991, the

U.S. Fish and Wildlife Service found levels of zinc, principally derived from livestock waste, in waters in a Texas wildlife refuge that were higher than the soil cleanup level for hazardous waste sites (50). Elevated levels of these and other metals in livestock waste adversely affect fish populations. Bottom-feeding aquatic birds are particularly susceptible to exposure to toxic constituents accumulated from livestock waste because these birds are attracted to shallow feedlot waste water ponds and waters adjacent to feedlots (50).

4. Soil Pollution

Soil resources can become contaminated with high levels of minerals/metals (phosphorus, potassium, copper, cadmium, and zinc) when excessive amounts of animal waste are applied to land. A decline in soil fertility, increased groundwater pollution, and the deposition of potentially acid-forming substances have been noted in the Netherlands because of overapplication of wastes from the country's concentrated livestock production (54). Soil phosphorus levels far greater than those needed by crops or forage are common in some areas of the United States (10). Although crop damage due to excessive soil phosphorus levels is uncommon, when erosion of contaminated soil occurs, surface water pollution may result.

5. Acid Deposition

The role of ammonia in acidification has only recently been quantified. A study conducted in the Netherlands indicated that approximately 25 percent of acid deposition in the Netherlands comes from ammonia and 90 percent of ammonia comes from agriculture (55).

6. Global Climate Change

Methane emissions from livestock waste contribute to global warming. More methane is produced when the waste is subjected to anaerobic, rather than aerobic, conditions. Methane absorbs infrared radiation and acts as a greenhouse gas. Furthermore, methane present in the troposphere can react with other chemical species to produce ozone, which is also a greenhouse gas. Tropospheric ozone-forming reactions actually contribute to depletion of ozone in the stratosphere, where ozone blocks harmful ultraviolet radiation.

Methane accounts for 15 percent of the expected global warming from the greenhouse effect (56). Methane production from livestock waste management systems constitutes 7 percent of global methane production, while methane produced directly by ruminant animals constitutes another 20 percent of global methane production (56).

VI. COSTS OF LIVESTOCK WASTE POLLUTION

The costs of livestock waste pollution are significant. For instance, pathogens from animal waste may enter the waters overlying shellfish beds; valuable shellfish resources will be closed when pathogen counts exceed acceptable limits. Dairy waste pollution has limited the use of Oregon's Tillamook Bay, a resource that would otherwise have supported a \$1.5 million annual shellfishing industry. Tillamook Bay has recently reopened to shellfishing, but it was closed for a significant period of time. Shellfish beds have also been closed in North Carolina and Washington because of animal waste pollution.

Waters may also be closed to recreation if pathogen counts exceed health limits. Numerous ponds, lakes, and estuaries have been closed to swimming and contact recreation because of livestock waste pollution. The affected States include Louisiana, Maryland, and Maine. Local economies may lose revenue when recreational waters are closed. Dairy waste in Tillamook Bay, near Portland, Oregon, was identified as the primary cause of contamination that resulted in the loss of 70,000 visitor-days per year (57).

The cost associated with remediation of underground drinking water supplies (to reduce the concentration of nitrate to safe levels) is very high and would be uneconomical for individual well users and small rural community suppliers. Thus, affected communities must bear the cost of searching for alternative sources of water or treating the water they draw. The salt load into the Chino Basin from local dairies is 1,536 tons/year, and at the current cost of \$320 to \$690 for every ton of salt removed by treatment, the annual treatment cost would be more than \$1 million just to maintain the current ground water nitrate levels (41).

VII. REGIONAL DATA AND REGIONAL COMPARISON OF FEEDLOTS AND OTHER SOURCES OF POLLUTION

Tables 4 through 8 give the Workgroup's estimates of the percentages of water use impairments caused by CSOs, storm sewers/runoff, and feedlots in each Region. Tables 9 through 13 show the percentages of assessed waters impaired by CSOs, storm sewers/runoff, and feedlots in each Region. Estimated feedlot impairments are greater than the National average rate of feedlot impairments for inland waters in Regions 4, 6, 7, 8, and 10, and for estuaries in Regions 4 and 10.

Estimated CSO impairments are greater than the National CSO impairment rate for inland waters in Regions 1, 3, and 5, and for coasts/estuaries in Regions 1, 2, and 10.

Estimated storm sewer/runoff impairments are above the National storm sewer impairment rate for inland waters in Regions 1, 4, 6, 7, 9, and 10, and for coasts/estuaries in Regions 1, 2, 4, and 10.

In addition, it is estimated that feedlot pollution affects at least as many river miles as either CSOs or storm sewers in all but Regions 1, 2, and 9 and more lake acres in Regions 7 and 8.

**REGIONAL FINDINGS
PERCENTAGE OF WATER USE IMPAIRMENTS CAUSED BY CSOs, STORM SEWERS, AND FEEDLOTS**

Table 4. Percentage of Water Impairments Caused by CSOs, Storm Sewers/Runoff, and Feedlots in U.S. RIVERS in Regions 1-10

	CSOs	Storm Sewers/Runoff	Feedlots
Region 1	13	36	0
Region 2	2	3	0
Region 3	3	6	9
Region 4	0	16	23
Region 5	9	10	13
Region 6	1	14	28
Region 7	0	9	88
Region 8	0	2	7
Region 9	0	11	4
Region 10	0	14	17

Table 5. Percentage of Water Impairments Caused by CSOs, Storm Sewers/Runoff, and Feedlots in U.S. LAKES in Regions 1-10

	CSOs	Storm Sewers/Runoff	Feedlots
Region 1	0	41	0
Region 2	1	2	0
Region 3	0	18	0
Region 4	0	75	35
Region 5	0	23	2
Region 6	0	0	0
Region 7	0	20	50
Region 8	0	10	17
Region 9	0	1	0
Region 10	0	4	0

Table 6. Percentage of Water Impairments Caused by CSOs, Storm Sewers/Runoff, and Feedlots in the GREAT LAKES in Regions 2 and 5

	CSOs	Storm Sewers/Runoff	Feedlots
Region 2	3	3	0
Region 5	10	8	0

Table 7. Percentage of Water Impairments Caused by CSOs, Storm Sewers/Runoff, and Feedlots in U.S. ESTUARIES in Regions Having Estuaries

	CSOs	Storm Sewers/Runoff	Feedlots
Region 1	29	43	0
Region 2	47	42	0
Region 3	0	5	0
Region 4	0	70	9
Region 6	0	0	0
Region 9	No data	No data	No data
Region 10	10	30	11

Table 8. Percentage of Water Impairments Caused by CSOs, Storm Sewers/Runoff, and Feedlots in U.S. COASTS in Regions Reporting Data on Non-Estuarine Coasts

	CSOs	Storm Sewers/Runoff	Feedlots
Region 2	17	0	0
Region 4	0	83	0
Region 9	0	0	0

Table 9. Percentage of Assessed Waters Impaired by CSOs, Storm Sewers/Runoff, and Feedlots in U.S. RIVERS in Regions 1-10

	CSOs	Storm Sewers/Runoff	Feedlots
Region 1	1	3	0
Region 2	0	0	0
Region 3	1	2	3
Region 4	0	5	7
Region 5	2	3	3
Region 6	1	5	10
Region 7	0	6	59
Region 8	0	1	2
Region 9	0	8	3
Region 10	0	8	9

Table 10. Percentage of Assessed Waters Impaired by CSOs, Storm Sewers/Runoff, and Feedlots in U.S. LAKES in Regions 1-10

	CSOs	Storm Sewers/Runoff	Feedlots
Region 1	0	8	0
Region 2	0	1	0
Region 3	0	3	0
Region 4	0	25	12
Region 5	0	7	1
Region 6	0	0	0
Region 7	0	7	16
Region 8	0	4	7
Region 9	0	0	0
Region 10	0	2	0

Table 11. Percentage of Assessed Waters Impaired by CSOs, Storm Sewers/Runoff, and Feedlots in the GREAT LAKES in Regions 2 and 5

	CSOs	Storm Sewers/Runoff	Feedlots
Region 2	3	2	0
Region 5	2	2	0

Table 12. Percentage of Assessed Waters Impaired by CSOs, Storm Sewers/Runoff, and Feedlots in U.S. ESTUARIES in Regions Having Estuaries

	CSOs	Storm Sewers/Runoff	Feedlots
Region 1	5	7	0
Region 2	12	11	0
Region 3	0	4	0
Region 4	0	15	2
Region 6	0	0	0
Region 9	no data	no data	no data
Region 10	6	17	6

Table 13. Percentage of Assessed Waters Impaired by CSOs, Storm Sewers/Runoff, and Feedlots in U.S. COASTS in Regions Reporting Data on Non-Estuarine Coasts

	CSOs	Storm Sewers/Runoff	Feedlots
Region 2	9	0	0
Region 4	0	10	0
Region 9	0	0	0

VIII. CONCLUSIONS

The Workgroup's analysis of the magnitude of feedlot pollution indicates that feedlots cause 7 percent of all impairments in U.S. lakes and 13 percent of all impairments in U.S. rivers. Nationally, estimated feedlot pollution is comparable in magnitude to pollution from CSOs or storm sewers/runoff. This analysis indicates that feedlot pollution affects at least as many river miles as CSOs or storm sewers in seven Regions. Feedlot pollution does impact U.S. coasts and estuaries, but CSOs or storm sewers are significantly greater impacts to these coastal waters. Furthermore, the relative impacts from feedlots versus these other two sources varies from Region to Region, and indeed from State to State.

IX. FURTHER ACTION BY THE FEEDLOT WORKGROUP

The Feedlot Workgroup recommends further study of the policy issues concerning feedlots. This effort will be aimed at developing strategies and guidance for reduction of feedlot pollution utilizing tools available to the Agency under NPDES, nonpoint source, and groundwater protection programs. The subgroups involved in developing these documents should also include representatives of the USDA. Since the degree of feedlot impact varies among different geographic areas, a watershed or Regional approach to the solution of feedlot problems will be considered.

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APPENDIX A
METHOD OF ANALYSIS USED TO DETERMINE MAGNITUDE OF FEEDLOT,
CSO, AND STORM SEWER/RUNOFF POLLUTION

The results of this analysis are determined by the three basic steps given below:

Step One: Using data from the section 319 summary report, calculate the percentage of agriculture impacts that are caused by feedlots.

Step Two: Using data from the section 305(b) summary report, calculate the percentage of all water quality impacts that are caused by agriculture.

Step Three: Multiply the results of Step One and Step Two to calculate the percentage of all water quality impairments caused by agriculture.

Summary data for each State were obtained directly from the most recent section 305(b) and 319 summary reports, respectively titled *National Water Quality Inventory: 1990 Report to Congress* and *Managing Nonpoint Source Pollution: Final Report to Congress (1989): Appendix A*. The summary section 319 report gives the following useful data: amounts of assessed waters that partially support or do not support uses and have as sources all agriculture, feedlots, animal holding areas, and unspecified agriculture. The summary section 305(b) report gives the following useful information: the amounts of assessed waters; the amounts of assessed waters impaired by agriculture, storm sewers/runoff, and combined sewers; and the amounts of impaired waters.

The method of analysis outlined below is used to determine the magnitude of feedlot impacts for the Nation as well as for each State and Region. In each case, all data from the appropriate set of States (a set of States is one State for a State estimate, all States that make up a Region for Regional estimates, and all States for a National estimate) are used.

Of the two summary reports, only the summary section 319 report gives feedlot-specific data. Therefore, section 319 data are used to calculate the percentage of agricultural impairments that are caused by feedlots. However, in the section 319 data, only about 40 percent of use impairments ascribed to agriculture are further ascribed to a specific agricultural source such as irrigated crops or feedlots. It is reasonably expected that feedlots cause a fraction of the nonspecified agriculture impacts. Assuming that the specified agricultural sources are a statistical sample of all agricultural sources, the percentage of agriculture impairments that are caused by feedlots is calculated by the following method.

For each set of States, impairments from feedlots and animal holding areas (reported in the section 319 summary assessment) that cause nonsupport or partial support of designated uses are summed (impairments caused by animal holding areas and feedlots are added since

there is concentrated manure deposition in both of these sources and animal waste is the cause of pollution from these sources).¹ The sum is designated as A. The ratio of A:B is determined, where B = (the sum of all impairments attributed to specified agriculture categories). B is the sum of "all agriculture" impairments from the section 319 summary data minus the sum of all "unspecified agriculture" impairments from the 319 data. Thus, $((A:B) \times 100\%)$ is the percentage of specified agricultural impairments caused by feedlots.

The 305(b) report includes data for all sources (point and nonpoint) of water pollution, and use of 305(b) data is thus necessary to calculate the fraction of all water use impairments caused by feedlots and thereby provide a basis of comparison between feedlots and other (point) sources of pollution.

It is assumed that the waters assessed in the 305(b) report are representative of all waters. The percentage of water use impairments caused by agriculture can be calculated solely from 305(b) data. The percentage of water use impairments caused by CSOs and storm sewers can also be calculated from 305(b) data. The total amount of waters not supporting or partially supporting designated uses due to a particular source are summed and divided by the total amount of waters not meeting designated uses. A final result for the percentage of impairments caused by feedlots is obtained by multiplying the percentage of impairments caused by agriculture (as obtained from 305(b) data) by the percentage of specified agriculture impairments caused by feedlots (obtained from 319 data).

To determine the percentage of assessed waters that are impaired by a particular source, the percentage of impairments caused by that source is multiplied by the total amount of impaired waters and divided by the total amount of assessed waters.

¹ The section 319 summary data include complete data for three levels of impairment: threatened, nonsupport, and partial support of designated uses. The section 305(b) summary report provides complete data only for impairments that cause nonsupport and partial support of uses. Our analysis excludes section 319 data on threatened waters and thereby "levels the field" between section 305(b) and section 319 data.

**FEEDLOTS CASE STUDIES OF
SELECTED STATES**

September 1993

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EXECUTIVE SUMMARY

The 1972 Clean Water Act (CWA) requires the U.S. Environmental Protection Agency (EPA) to administer a national permit program to regulate point source discharges of pollutants to waters of the United States. In 1974, EPA established the National Pollutant Discharge Elimination System (NPDES), which prohibits discharges of any pollutant to waters of the United States from a point source (including concentrated animal feeding operations) unless the discharge is authorized by a NPDES permit.

Nearly 20 years after the establishment of the NPDES program, many animal feeding operations continue to discharge significant amounts of livestock wastes into waters of the United States. Recent sections 319 and 305(b) of the CWA water quality assessments indicate that there is widespread water impairment due to livestock wastes. In "Water Pollution From Feedlot Waste: An Analysis of its Magnitude and Geographic Distribution", the U.S. EPA's Feedlot Workgroup estimated that animal feeding operations cause 7% of lake impairment and 13% of river impairment.

Although most major livestock-producing States have implemented programs for livestock waste control, ~~many concentrated~~ animal feeding operations (CAFOs) do not have permits and continue to pollute surface water and ground water. For example, EPA estimated in 1992 that there were more than 1,000 CAFOs in Region VI that were not covered by a NPDES permit. States have not successfully regulated CAFOs for a number of reasons, including:

- Limited resources to implement and enforce permitting programs,
- Difficulty in identifying contributing livestock facilities, and
- Difficulty in interpreting and administering EPA's NPDES regulations.

To improve program performance and mitigate the pollution of surface water and ground water by CAFOs, EPA wants to encourage the consistent use of the regulations and bring CAFOs into compliance with NPDES requirements. This report summarizes the major components of selected States' livestock waste control permitting programs and identifies the critical components of a comprehensive feedlot waste management program. The primary objectives of this study were to:

- Gather information from various States on the essential components of current livestock waste control programs;
- Identify the major components of a comprehensive feedlot waste management system; and
- Identify the costs and benefits of implementing a comprehensive livestock waste control program;
- Assess the extent of variation in the interpretation of the NPDES feedlot regulations by States.

Feedlots Case Studies of Selected States

Standardized questions about livestock waste permitting programs were asked of officials from seven States and EPA Region VI. (See Appendix A for a copy of the survey.) These States and Region VI were chosen for the following reasons:

Arkansas	<ul style="list-style-type: none"> • largest producer of broiler chickens • sixth largest inventory of laying chickens • noted for high-quality recreational lakes and parks
Indiana	<ul style="list-style-type: none"> • second largest State producer of chickens other than broilers • fourth largest hog-producing State • concerns associated with increasing urbanization
Iowa	<ul style="list-style-type: none"> • largest producer of hogs • major cattle-producing State
Kansas	<ul style="list-style-type: none"> • third largest producer of fed cattle
Nebraska	<ul style="list-style-type: none"> • second largest producer of fed cattle
Wisconsin	<ul style="list-style-type: none"> • major dairy State • has devoted substantial resources to controlling livestock waste
Washington	<ul style="list-style-type: none"> • developing a general permit for dairy operations
EPA Region VI	<ul style="list-style-type: none"> • developed a NPDES general feedlots permit for four undelegated States (LA, NM, OK, TX)

1. Program Status

To determine the status of each State's livestock waste control program, we examined each program's regulatory authority, permit coverage, types of permits issued, number of facilities permitted, and the personnel resources dedicated. Table 1 summarizes this information.

Arkansas, Indiana, Iowa, Kansas, and Washington have State regulatory authority for CAFOs that are in addition to the implementation of the NPDES regulations. In Arkansas, for example, this additional regulatory authority is provided in State Regulation No. 5, "Liquid Animal Waste Management Systems." A liquid animal waste management system is any system used for the collection, storage, distribution, or disposal of animal waste in liquid form generated by a confined animal operation. Regulation No. 5 requires any confined animal feeding operation using a liquid animal waste management system to obtain a no-discharge permit that prohibits the discharge of process wastewater to the waters of the State at any time, including periods of precipitation in excess of the 25 year, 24-hour storm event.

States generally require NPDES permits for facilities with more than 1,000 animal units (AUs) that discharge in instances other than the 25 year, 24-hour storm event. NPDES permits also are required for facilities with less than 1,000 AUs if there is the potential for discharges of pollutants into the waters of the State at times other than the event of a 25 year, 24-hour storm. However, there are exceptions. Kansas and Wisconsin issue NPDES permits to all facilities with more than 1,000 AUs, regardless of their discharge potential. Nebraska, however, focuses on discharge potential rather than size. The State determines on a case-by-case basis whether a CAFO must have a NPDES permit, regardless of size.

Table 1. Program Status: Summary by Surveyed State

Surveyed State	Permit Coverage	Types of Permits	Number of Facilities Permitted	Resources Dedicated
Arkansas	<ul style="list-style-type: none"> All facilities with liquid animal waste systems 	<ul style="list-style-type: none"> NPDES, individual, and draft general State 	<ul style="list-style-type: none"> 0 NPDES 860 State 	<ul style="list-style-type: none"> 2.5 FTEs
Indiana	<ul style="list-style-type: none"> Facilities with >300 AUs that discharge, or Facilities with >300 cattle, > 600 swine, or >30,000 fowl 	<ul style="list-style-type: none"> NPDES, individual State (approval letters) 	<ul style="list-style-type: none"> 0 NPDES 4,000-5,000 State 	<ul style="list-style-type: none"> 1 FTE
Iowa	<ul style="list-style-type: none"> Open feedlots with >1,000 AUs, or Open feedlots with >300 AUs with a manmade discharge device, or Confinement operations with anaerobic lagoons, or Confinement operations with >200 AUs using earthen waste storage, or Confinement operations with >2,000 AUs using a formed waste storage tank 	<ul style="list-style-type: none"> NPDES, individual State, construction 	<ul style="list-style-type: none"> 15 NPDES unknown, State 	<ul style="list-style-type: none"> 1.7 FTEs
Kansas	<ul style="list-style-type: none"> Facilities with >1,000 AU, or Facilities that utilize wastewater controls, or Facilities that have the potential to pollute 	<ul style="list-style-type: none"> NPDES, individual State (permits and certificates of compliance) 	<ul style="list-style-type: none"> 300 NPDES 2,472 State 	<ul style="list-style-type: none"> 9 FTEs
Nebraska	<ul style="list-style-type: none"> Facilities that violate or threaten State water quality or State ground water quality standards, or Facilities that discharge into waters of the State, or Facilities that violate the Nebraska Environmental Protection Act 	<ul style="list-style-type: none"> NPDES, individual State 	<ul style="list-style-type: none"> 213 NPDES 1,100 State 	<ul style="list-style-type: none"> 2.5 FTEs
Region VI	<ul style="list-style-type: none"> Facilities with >1,000 AUs and facilities with 300 or more AUs which discharge via a man-made device or directly into surface waters. Only facilities that discharge in other than a 25 year, 24-hour storm are considered 	<ul style="list-style-type: none"> NPDES, general and individual 	<ul style="list-style-type: none"> <10 	<ul style="list-style-type: none"> 1 FTE
Washington	<ul style="list-style-type: none"> Commercial dairies with >300 AUs, or Any dairy which causes a water quality violation 	<ul style="list-style-type: none"> NPDES, proposed general 	<ul style="list-style-type: none"> 0 	<ul style="list-style-type: none"> 6 FTEs
Wisconsin	<ul style="list-style-type: none"> Facilities with >1,000 AUs, or Facilities designated as a significant source of pollution 	<ul style="list-style-type: none"> NPDES 	<ul style="list-style-type: none"> 43 	<ul style="list-style-type: none"> 5 FTEs

FTE = Full-time equivalent.

Feedlots Case Studies of Selected States

Besides NPDES permits, many States require other livestock waste control or waste control structure-related permits. The coverage of State-issued construction, operating, and livestock waste control permits varies greatly by waste management program. The need for a permit is based on some or all of these factors: feedlot type, presence of a wastewater control system, and potential to discharge. Kansas and Wisconsin require permits for certain feedlot capacities (i.e., greater than 1,000 AUs), but these States also have catch-all caveats that require permits for any livestock facility that has the potential to pollute. Nebraska requires a permit for any facility that discharges into waters of the State. Any livestock operation with a wastewater control facility must have a permit in Arkansas and Kansas. Indiana's State waste control program focuses solely on facility size (see Table 1).

All of the States surveyed and Region VI issue NPDES permits or propose to do so. Arkansas and Washington are developing NPDES general permits. Region VI has issued a general NPDES permit in each of its four non-delegated States. These permits become final on March 10, 1993. Arkansas, Indiana, Iowa, Kansas, and Nebraska also have State construction, operating, and/or waste control facility permitting programs.

The number of facilities issued permits (or similar legal documents) by surveyed States range from eight in Washington to approximately 4,500 in Indiana. All surveyed States with implemented programs have tracking systems to record permit statistics. The more detailed systems record the number of permitted livestock operations by livestock category and size, and they keep separate statistics for NPDES and State permits. Other recording systems aggregate NPDES numbers with State permit numbers.

As shown in Table 1, the number of FTEs (full time equivalent employees) dedicated to permitting, inspecting, and enforcing livestock waste control regulations ranges from one in Indiana to nine in Kansas. In most cases, the lack of personnel was identified as the primary impediment to effective implementation of State waste control programs. Permitting staff from surveyed States reported these problems caused by insufficient staff: the inability to identify unpermitted facilities, backlogs of permit applications, inability to make scheduled facility inspections, and the inability to enforce permit conditions and pursue penalty collection.

2. Permitting Process

Components of a livestock waste control permitting program are outlined in Table 2 and include: unpermitted CAFO identification, screening tools, public comment provisions, and inspection requirements. While these components are basically the same for all surveyed programs, emphasis on particular elements varies by program and, in some cases, by type of livestock confined.

Depending upon a State's resources and philosophy, unpermitted CAFOs are identified voluntarily by the operator, by State agencies, or by the public. While some operators are aware of State and federal requirements for waste control facilities, many are not. In Arkansas, most of the major swine and poultry contractors require their facility operators to obtain the necessary livestock waste control permits. Permitting programs in Iowa and Nebraska rely on the efforts of industry groups (i.e., pork and beef producer councils) to

Table 2. Permitting Process: Summary by Surveyed State

	Unpermitted CAFO Identification	Screening Tools	Public Comment Provisions	Inspection Requirements
Arkansas	<ul style="list-style-type: none"> Complaints, fish kill reports, or contractors 	<ul style="list-style-type: none"> Enforcement tracking list 	<ul style="list-style-type: none"> 30-day public comment period 	<ul style="list-style-type: none"> Draft general permit requires annual inspection by permittee
Indiana	<ul style="list-style-type: none"> Fish kill reports, complaints, or contact with agriculture lenders 	<ul style="list-style-type: none"> Facility location 	<ul style="list-style-type: none"> None for State program 	<ul style="list-style-type: none"> None for State program
Iowa	<ul style="list-style-type: none"> Educational efforts from industry groups 	<ul style="list-style-type: none"> Facility size and type, and type of waste control system 	<ul style="list-style-type: none"> 30-day public comment period 	<ul style="list-style-type: none"> NPDES every five years
Kansas	<ul style="list-style-type: none"> Unannounced visits, complaints, or fish kill reports 	<ul style="list-style-type: none"> Potential to cause human health effects, aquatic damage, or nuisance complaints 	<ul style="list-style-type: none"> 30-day public comment period 	<ul style="list-style-type: none"> Pre-construction site appraisal Construction inspection Post-construction inspection NPDES permitted facilities at least once per year State permitted facilities every 2 years
Nebraska	<ul style="list-style-type: none"> Educational efforts from industry organizations 	<ul style="list-style-type: none"> Potential for discharge, topography, or facility location 	<ul style="list-style-type: none"> 30-day public comment period 	<ul style="list-style-type: none"> On-site inspections of both new & existing facilities to determine need for waste control system Large permitted facilities at least once per year
Region VI	<ul style="list-style-type: none"> Meetings and public hearings regarding permit availability 	<ul style="list-style-type: none"> discharge monitoring reports, public complaints, or water quality problems 	<ul style="list-style-type: none"> Approximately 6 week comment period during general permit development. No public comment for individual existing facilities covered by general permit. New facilities permitted with individual permits are required to have a public comment period. 	<ul style="list-style-type: none"> Permit requires annual facility inspection by the permittee.
Washington	<ul style="list-style-type: none"> Complaint-driven 	<ul style="list-style-type: none"> Waste storage capacity acreage available for waste disposal, and proximity to surface waters 	<ul style="list-style-type: none"> 50-day formal public comment period Three series of five public comment meetings 	<ul style="list-style-type: none"> Determined at initial site inspection
Wisconsin	<ul style="list-style-type: none"> Informal monitoring network 	<ul style="list-style-type: none"> Facility size 	<ul style="list-style-type: none"> 30-day public comment period 	<ul style="list-style-type: none"> Pre-construction site inspection

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educate operators on the necessity of waste controls and permits. Iowa also works with other State and federal agencies (e.g., SCS and the Extension Service) as well as through investigation of complaints and pollution incidents. Indiana, Kansas, and Washington rely mainly on complaint-driven CAFO identification. Examples of identification methods include nuisance complaints (usually from neighbors), property transfers, fish kill reports, and unannounced facility visits.

Screening tools help the State regulating agency prioritize unpermitted livestock facilities targeted for permitting. Facility size and location are two of the more common screening criteria used by the programs surveyed. For example, if a regulating agency has a backlog of permit applications, its staff usually try to complete the permitting process on the larger livestock operations before they begin on the smaller ones. Proximity to creeks, streams, and other bodies of water and to residences also is frequently used as a screening tool. Interviewees also cited as screening criteria: facility type (swine, beef cattle, dairy, etc.), waste control system type (anaerobic lagoon, aerobic lagoon, settling basin, etc.), waste control system capacity, potential for discharge, potential to cause human health effects, and topography.

Public comment provisions vary somewhat among the surveyed States. Washington had a 50-day formal public comment period for its draft general permit. Arkansas, Iowa, Kansas, Nebraska, and Wisconsin have 30-day public comment period provisions.

Inspection requirements vary greatly among surveyed programs. Inspections can be categorized as initial (such as pre- and post-construction inspections) and scheduled (such as semi-annual, annual, or biennial). Arkansas, Indiana, and Iowa do not require initial inspections of proposed livestock waste control facilities. Kansas, Nebraska, Washington, and Wisconsin all require at least one inspection; Kansas requires three. Arkansas, Iowa, Kansas, Nebraska, Region VI, and Washington have some provisions for scheduled inspections; Nebraska regularly inspects only large facilities, while Washington sets the inspection schedule after the initial inspection. The Region VI permit requires annual inspections by operators, records of which must be kept at the facility and made available upon request. The Region VI general permit also has provisions for periodic inspections by qualified staff.

3. Enforcement

Overall, State waste control permitting agencies dedicate only a relatively small portion of the program's effort and resources to the enforcement of permit conditions. Most regulating agencies emphasize inspecting and permitting, and do not have sufficient human resources for the enforcement of permit conditions. Table 3 presents a summary of three enforcement issues: authority to levy fines, procedures to identify and correct violations, and penalties.

Table 3. Enforcement: Summary by Surveyed State

Surveyed State	Authority to Levy Fines	Procedures to Identify and Correct Violations	Penalties
Arkansas	<ul style="list-style-type: none"> Arkansas Department of Pollution Control & Ecology 	<ul style="list-style-type: none"> Scheduled inspections, complaints, or fish kill reports Warning letter, fine, moratorium, permit revocation, contractor contact 	<ul style="list-style-type: none"> Civil: up to \$10,000 fine. Criminal: from 1-year jail sentence and/or \$25,000 fine to 20-year sentence and/or \$250,000 fine. Costs, expenses and damages incurred during enforcement.
Indiana	<ul style="list-style-type: none"> Indiana Department of Environmental Management 	<ul style="list-style-type: none"> Complaints, documented violations Telephone call, restrictions Formal enforcement actions 	<ul style="list-style-type: none"> Civil penalty: up to \$10,000 for violating filing or reporting requirements Civil penalty: up to \$25,000/day for negligent violation of permit
Iowa	<ul style="list-style-type: none"> Iowa Department of Natural Resources State attorney general may request court system to levy fines 	<ul style="list-style-type: none"> Complaints, field investigation, enforcement actions 	<ul style="list-style-type: none"> Administrative penalty: up to \$10,000/day Civil penalty: up to \$25,000/day for negligent permit violation Resource damage assessment to cover value of fish kill
Kansas	<ul style="list-style-type: none"> State attorney general 	<ul style="list-style-type: none"> Staff visits, complaints Work with operator to resolve problem 	<ul style="list-style-type: none"> \$2,500-\$25,000 fine for unpermitted discharges Civil penalties of up to \$10,000 for violations of permit conditions, water quality standards, filing or reporting requirements
Nebraska	<ul style="list-style-type: none"> State attorney general 	<ul style="list-style-type: none"> Complaints & fish kill reports, warning letter, enforcement action 	<ul style="list-style-type: none"> Administrative actions, enforcement proceedings Permit modification, revocation and reissuance, or termination
Region VI	<ul style="list-style-type: none"> EPA Region VI 	<ul style="list-style-type: none"> Water quality problems; notices of discharges; complaints 	<ul style="list-style-type: none"> Civil penalty not to exceed \$25,000/day of violation and/or imprisonment not exceeding one year
Washington	<ul style="list-style-type: none"> Washington Department of Ecology State attorney general 	<ul style="list-style-type: none"> Complaints & site inspections Informal action, voluntary compliance Formal enforcement actions 	<ul style="list-style-type: none"> Permit condition modification, revocation and reissuance, or termination Administrative order Civil penalty: \$250-\$10,000/day Resource damage assessments
Wisconsin	<ul style="list-style-type: none"> Wisconsin Department of Natural Resources 	<ul style="list-style-type: none"> Complaints & site inspections Notice of Discharge WPDES permit issuance Formal enforcement actions 	<ul style="list-style-type: none"> Civil penalty: up to \$10,000/day for permit violations Civil penalty: up to \$25,000/day for negligent violations Civil penalty: up to \$10,000 for violations of filing or reporting requirements Resource damage assessments

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The authority to levy fines lies with the livestock waste regulating agency and/or the State attorney general. In Arkansas, Indiana, and Wisconsin, fines are levied and collected by the livestock waste regulating agencies. The authority to levy fines in Kansas and Nebraska lies with the State attorney general. In Washington, both the State regulating agency and the attorney general can levy fines against permit violators. In Iowa, the regulating agency has authority to levy fines. The attorney general may, however, initiate legal action, including requesting the court system to levy fines.

Most procedures to identify and correct permit violations involve a sequence of actions that usually begin with the receipt of a complaint and end with an enforcement or corrective action. All State permitting officials cite complaints and fish kill reports as a way to identify problem facilities. Except in Indiana and Iowa, inspections or "staff visits" (usually unannounced) are also used to identify operations in violation. After identifying a violation, most regulating authorities ask the operator to voluntarily correct the problem. If the operator fails to do so, formal enforcement actions may be initiated.

Kansas officials point out that after financial penalties are paid, an operator may not have money available to correct the cause of the violation.

Penalties assessed against permit violators range from administrative actions, permit modifications, and assessments equal to the value of resource damages (fish kills, etc.) to civil and criminal penalties of up to \$250,000 in fines and/or 20-year jail sentences. Civil penalties are likely to be higher in cases of willful or negligent discharges. In Arkansas, any person who purposely discharges and thereby places another person in imminent danger can be convicted of a felony and subject to imprisonment for as long as 20 years and/or a fine not exceeding \$250,000. In Indiana, the permitting staff attempt to assess several large, highly publicized penalties each year to encourage widespread compliance.

4. Program Costs and Benefits

The costs and benefits of livestock waste management programs are difficult to estimate because of a lack of data. Table 4 summarizes four issues associated with program costs and benefits: estimated FTEs required, cost-share funding, farmer-incurred costs, general versus individual permits, and interagency coordination.

Costs incurred by the regulating agencies are the number of FTEs needed to run an effective program. While some State agencies could estimate the optimal number of FTEs, others could not. However, all regulatory agencies report that their waste control programs were understaffed. Even Kansas, with the largest waste control staff of the surveyed programs (nine FTEs), attributes the State's four to five month backlog of new permit applications to insufficient personnel.

Cost-share funding is available from the U.S. Department of Agriculture's (USDA) Agricultural Conservation Program (ACP), university grants, State agriculture departments, and non-point source water pollution abatement programs. Dairy operators historically have had strong participation in ACP cost-share funding. Operators in Wisconsin and Washington, major dairy States, received nearly \$1.9 and \$0.7 million respectively, in ACP

Table 4. Program Costs and Benefits: Summary of Surveyed States

Surveyed State	Estimated FTEs Required	Cost-Share Funding	Farmer Incurred Costs	General vs. Individual Permits	Interagency Coordination
Arkansas	<ul style="list-style-type: none"> Unknown 	<ul style="list-style-type: none"> \$422,705 from ACP for ag waste facilities ACP funds utilized primarily by dairy operators 	<ul style="list-style-type: none"> Costs associated with recordkeeping, reporting, pollution prevention plan, monitoring, and permit fees 	<ul style="list-style-type: none"> General permit's advantage in time savings 	<ul style="list-style-type: none"> ADPCE_SCS for technical requirements ADPCE_AS&WCD for management plans
Indiana	<ul style="list-style-type: none"> 6-7 FTEs 	<ul style="list-style-type: none"> \$130,456 from ACP for ag waste facilities Grants from Purdue University to study waste control alternatives Permitting staff would limit cost-share funds to existing operations 	<ul style="list-style-type: none"> No permit fees 	<ul style="list-style-type: none"> State programs' emphasis on site-specific plans and inspections give no reported advantage to general permits 	<ul style="list-style-type: none"> IDEM_SCS for technical requirements and complaint response County board of health and sanitarian for complaint response
Iowa	<ul style="list-style-type: none"> Unknown 	<ul style="list-style-type: none"> \$82,148 from ACP for ag waste facilities Small amount available from State Water Protection Fund for <u>existing</u> facilities Permitting staff would limit to lowest cost projects and to improve facilities at existing operations 	<ul style="list-style-type: none"> No permit fees Costs associated with public notice for NPDES 	<ul style="list-style-type: none"> State regulations give IDNR authority to enforce minimum requirements on <u>all</u> facilities (permitted or not), so no reported advantage in a general permit 	<ul style="list-style-type: none"> IDNR Section 319 funds to train SCS to design facilities, establish on-farm demonstrations, and support county-wide programs
Kansas	<ul style="list-style-type: none"> 12 FTEs 	<ul style="list-style-type: none"> \$9,327 from ACP for ag waste facilities Permitting staff would like to fund grass filters State Conservation Commission funds also are available 	<ul style="list-style-type: none"> Annual permit fee varies with facility type and size Costs associated with public notice period 	<ul style="list-style-type: none"> Little advantage in general permit due to state's emphasis on facility specific plans and inspections Individual waste control permit requires between 27 hours and 3 months to process 	<ul style="list-style-type: none"> KDHE_SCS for technical requirements Animal Health Department provides health operating licenses Division of Water Resources issues water appropriation construction permits

Table 4. Program Costs and Benefits: Summary of Surveyed States (continued)

Surveyed State	Estimated FTEs Required	Cost-Share Funding	Farmer Incurred Costs	General vs. Individual Permits	Interagency Coordination
Nebraska	<ul style="list-style-type: none"> 4.5 minimum 	<ul style="list-style-type: none"> \$39,000 from ACP for ag waste facilities Permitting officials would like to have funds for large CAFOs 	<ul style="list-style-type: none"> No permit fees Costs associated with public notice period 	<ul style="list-style-type: none"> No reported significant benefits of general permit due to state's on-site inspection and construction permit requirements NPDES program for CAFOs is minor part of state's total program 	<ul style="list-style-type: none"> NDEQ_SCS for technical requirements NDEQ_Bureau of Dairies & Foods for waste facility location approval
Region VI	<ul style="list-style-type: none"> Unknown 		<ul style="list-style-type: none"> Reporting, recordkeeping, training, monitoring, and pollution prevention plan development costs 	<ul style="list-style-type: none"> EPA is expected to incur lower costs with general vs. individual permit 	<ul style="list-style-type: none"> EPA Region VI_USDA Region VI_Fish & Wildlife Service
Washington	<ul style="list-style-type: none"> 6.0 FTEs 	<ul style="list-style-type: none"> Up to \$4.5 million competitively available from Centennial Clean Water Fund Up to \$4.5 million competitively available from State Revolving Fund loan program \$720,091 from ACP for ag waste facilities \$3 million from Referendum 39 for Conservation District dairy waste programs 	<ul style="list-style-type: none"> \$70-\$1,000 annual NPDES permit fee 	<ul style="list-style-type: none"> General permit advantage in administration costs and time savings 	<ul style="list-style-type: none"> WDOE_Conservation Commission for compliance plans under Agricultural Compliance Memorandum of Agreement program
Wisconsin	<ul style="list-style-type: none"> 3-5 FTEs 	<ul style="list-style-type: none"> \$1,871,637 from ACP for ag waste facilities Farmer's Fund for operators receiving a notice of discharge Nonpoint Source Water Pollution Abatement Program funds on a watershed basis 	<ul style="list-style-type: none"> No permit fees 	<ul style="list-style-type: none"> No reported general permit advantage due to small number of large operations to be permitted 	<ul style="list-style-type: none"> WDNR_USDA for some complaint investigation

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funding for 1991. The maximum in cost-share funds per operator of \$3,500 limits the usefulness of the ACP program to operators of small facilities. In many States (e.g., Iowa), however, most livestock producers will not receive assistance due to inadequate funding levels, the low priority given to cost-share for animal waste controls, and funds being limited to special project areas.

Farmers incur expenses associated with the implementation of waste management programs. The most significant expenses are the costs of building or upgrading waste control systems to meet permit specifications. In addition, operators incur costs associated with recordkeeping and reporting requirements, development of the pollution prevention plan, maintenance and operating expenses, employee training costs, and permit fees. These costs vary with facility type and size, facility condition, and operator experience; they may vary even by State. For example, permit fees range from \$30 per year for smaller facilities in Kansas to \$1,000 per year for large dairy operations (more than 1,000 AUs) in Washington.

A comprehensive feedlot waste management program utilizing general permits may be beneficial for regulating agencies, livestock operators, the public, and the environment. General permits allow adequate environmental protection for a large number of similar livestock operations without the administrative and resource costs associated with issuing individual permits. General permits can afford the same reporting and monitoring requirements, limitations, enforcement provisions, and other requirements as individual permits, while reducing the administrative burden on the regulating agencies. According to Region VI, Washington, and Arkansas, general permits reduce both the cost and time associated with implementing the NPDES program for CAFOs. The other States surveyed did not believe that a general permit would be beneficial for their programs.

In all surveyed States and Region VI, interagency coordination is critical to ensure that the technical requirements of the waste control permits are met. The regulating agencies work closely with USDA's Soil Conservation Service (SCS) to fulfill the permit's technical specifications and requirements. This was especially true during the development stages of the general permit in Region VI. Other agencies that work cooperatively with State regulating agencies include the county board of health (Indiana), Fish and Wildlife Service (Region VI), animal health department (Kansas), State bureau of dairies and foods (Nebraska), and the conservation commission (Washington).

**CONCENTRATED ANIMAL FEEDING OPERATION WASTE CONTROL
SURVEY RESULTS**

I. PROGRAM STATUS

This chapter discusses the status of confined livestock operations waste management programs and is organized by surveyed State/Region. It addresses such topics as regulatory authority, permit coverage, types of permits issued, number of permitted facilities, and the resources dedicated to administer the permitting program.

A. Arkansas

1. Regulatory Authority

The Arkansas Department of Pollution Control and Ecology (ADPCE) has regulatory jurisdiction over environmental aspects of livestock feeding operations and is authorized to act as the State water pollution control agency for the purposes of the amendments to the federal Water Pollution Control Act of 1972 (also known as the Clean Water Act). Arkansas has been authorized by EPA to administer the NPDES program and to issue general permits under the provisions of 40 CFR 122.28. However, the State has neither implemented nor permitted any livestock waste systems under the NPDES program. The ADPCE has developed a draft of a NPDES general permit.

Under State Regulation No. 5, "Liquid Animal Waste Management Systems," any confined animal operation using a liquid animal waste management system must obtain a no-discharge permit from the ADPCE. The ADPCE regulation prohibits the discharge of process wastewater from any confined animal operation with a liquid waste management system to the waters of the State at any time, **including** periods of precipitation in excess of the 25 year, 24-hour storm event or a series of chronic storm events. Under Regulation No. 5, ground water is included in the definition of "waters of the State."

2. Types of Permits

Arkansas's livestock waste permitting program issues one type of permit: a no-discharge water pollution control permit for any confined animal facility with a liquid waste management system. State permits are written for individual facilities.

Under Arkansas' draft NPDES general permit program, CAFOs with liquid waste management systems will be issued two permits. In accordance with ADPCE Regulation No. 5, a construction permit will be issued prior to the construction of a waste disposal system. (Existing facilities will already have a construction permit.) Following satisfactory completion of the facility, the operator must obtain an operating permit. The draft NPDES

general permit gives operational authority and coverage required by federal and State laws and regulations. Existing facilities with State-issued construction permits must submit a Notice of Intent (NOI) within 60 days of the effective date of the NPDES general permit. In lieu of general permit coverage, an operator may apply for an individual NPDES permit, but still must first obtain a construction permit.

3. Permit Coverage

All new and existing CAFOs may be covered under Arkansas's draft NPDES general permit. As provided in 40 CFR Part 122, Arkansas defines CAFOs as animal feeding operations which stable or confine and feed or maintain more than 1,000 AUs of slaughter or feeder cattle, mature dairy cattle, swine, or poultry. An animal feeding operation also can be considered a CAFO if, following an on-site inspection by Department personnel, it is designated by the ADPCE director as a significant contributor of pollution. While 40 CFR 122 Appendix B defines operations with less than 300 AUs that discharge through a man-made device as CAFOs, the provisions of ADPCE Regulation No. 5 prohibit the construction or operation of any man-made device for discharging pollutants into waters of the State.

State Regulation No. 5 prohibits the construction or operation of any hog, poultry, or dairy operation or other confined animal operation using liquid animal waste management systems until the owner has obtained a no-discharge water pollution control permit. Thus, the Arkansas permitting program focuses on issuing permits to all facilities with liquid waste systems regardless of facility size.

4. Number of Permitted Facilities

As of July 1990, there were 14 beef feedlots, 159 dairies, 573 hog operations, 40 broiler, fryer, and roaster operations, and 74 layer and hatchery operations with State permits for liquid waste systems, according to the ADPCE. The following table summarizes the total number of confined animal operations with over 300 AUs and the number of confined animal operations that have liquid animal waste system permits in Arkansas. The ADPCE does not keep records of the size of livestock operations that have been issued permits. Thus, the number of operations with liquid animal waste system permits may be greater than the number of operations with more than 300 AUs (i.e., dairy and swine), because some State permitted facilities are likely to be smaller than 300 AUs.

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Facility Type	Confined Animal Operations In Arkansas	
	Number Of Operations With Over 300 AUs ¹ 1/	Number Of Operations With Liquid Animal Waste System Permits ² 2/
Beef	18	14
Dairy	19	159
Swine	127	573
Broiler	1,257	40
Layers, Hatcheries	227	74
Total	1,648	860

Department officials could not estimate how many livestock facilities have a liquid animal waste management system, but do not have a waste management system permit. Enforcement staff in Arkansas believe that there are many unpermitted facilities that should have permits.

5. Resources for Program Administration

Arkansas does not have staff dedicated solely to the permitting of liquid livestock waste management systems; all employees work on other State permitting programs such as the industrial and municipal permitting programs. Two full-time employees are responsible for reviewing and issuing permits under the State's waste permitting programs (NPDES, State, municipal sludge permits, etc.). Another person works half-time on compliance and enforcement of liquid livestock waste control structures. In addition, the State has 14 NPDES field inspectors who are in charge of all NPDES inspections. ADPCE officials report that the State's NPDES field inspectors give little priority to inspections of liquid livestock waste control systems. Instead they focus on the inspection of other industrial waste facilities and publicly owned treatment systems.

¹ Source: U.S. Department of Commerce. 1989 (November). 1987 Census of Agriculture. "Beef" corresponds to USDC's "number of farms with cattle fattened on grain & concentrates sold." "Dairy" corresponds to USDC's "number of farms with inventories of milk cows." "Swine" corresponds to USDC's "number of farms with inventories of hogs and pigs." "Broiler" corresponds to USDC's "number of farms with sales of broilers and other meat-type chickens." "Layers, Hatcheries" corresponds to USDC's "number of farms with inventories of hens and pullets of laying age." **Because Census of Agriculture categories do not correspond exactly to the animal unit categories in the NPDES regulations, the numbers are approximations. For poultry facilities, the numbers from the Census of Agriculture were adjusted to reflect the fact that, on average, broiler farms produce 5-6 "batches" of broilers per year. Thus, the figures given here are estimates of the number of animal units in inventory.**

² Arkansas Department of Pollution Control and Ecology. 1990 (July 13). "Permit Data System—Milestone Report."

B. Indiana

1. Regulatory Authority

The Indiana Department of Environmental Management (IDEM) has jurisdiction over concentrated animal feeding operations. The NPDES regulations pertaining to concentrated animal feeding operations (CAFOs) are found in 327 IAC 5-4-3. The State program's authority is provided in IC 13-1-5.7 (Confined Feeding Control Law) of the Indiana Water Pollution Control Law. The State program focuses on eliminating all discharges into waters of the State. Because the State livestock waste control program is considered a non-point source program, its primary focus is the elimination of runoff and the optimal utilization of manure as fertilizer. The Indiana Stream Pollution Control Law (IC 13-1-3) specifies that the State livestock waste control program protects both the State's surface water and ground water.

2. Types of Permits

While Indiana has a NPDES permitting program for concentrated animal feeding operations, IDEM has not issued any NPDES permits to CAFOs. Indiana does have NPDES general permit authority, but IDEM staff said that individual permits would most likely be issued to CAFOs.

State regulations require IDEM to approve plans for confined feeding operations, so the state livestock waste control program focuses on plan review for new and existing livestock operations. IDEM issues letters of approval in lieu of State operating or construction permits. IDEM officials believe that, in addition to the NPDES program, a State permitting program will be in place within the next decade which will add manure management and reporting requirements to the State regulations.

Applications for State approval of waste control facilities must include detailed descriptions of the site, the proposed facility, facility design criteria, and land application requirements. The IDEM letters of approval consist of two sections. One section grants approval to construct a waste control facility. It expires if construction is not commenced within a year of issuance. The other section approves the operation of a wastewater control facility at a confined feeding operation, and it lasts indefinitely. The operating approval section expires only if major changes are made in the number or type of livestock, or in the acreage available for disposal. Approvals can be transferred to new owners or operators, as long as no major changes are made to the facility.

3. Permit Coverage

A NPDES permit is required of any operation that supports more than 1,000 AUs and discharges into waters of the State. A NPDES permit is also required for an operation with more than 300 AUs which discharges, directly or through a man-made device, into waters of the State.

A letter of approval is required of any operation that meets the State's definition of confined feeding operation, which is based on size alone: any confined feeding operation of 300 or more cattle (300 AUs), 600 or more swine (240 AUs) or 600 or more sheep (60 AUs), or 30,000 or more fowl (300 AUs). Any livestock feeding operation that causes water quality violations, or that elects to be covered, can also be designated a confined feeding operation. Construction of a confined feeding operation cannot begin without IDEM approval. The IDEM must approve the design of the waste control facility to ensure sufficient storage capacity and to ensure that sufficient acreage is available for the land application of waste.

4. Number of Permitted Facilities

Indiana has issued no NPDES permits to CAFOs. IDEM staff report that no operations in the State meeting the NPDES size requirements are discharging, and the State's current livestock waste control program is intended to prevent future discharges from new or expanded operations.

Approximately 4,500 letters of approval have been issued since the regulation of confined feeding operations began in 1971. Most approvals are granted to swine operations; poultry and dairy operations rank second and third. Very few approvals are issued to beef feeding operations. IDEM staff believe that 60 to 65 percent of the operations that come under the authority of the regulations have been approved.

5. Resources for Program Administration

One FTE in the central office works exclusively on the State livestock operation approval program, at an estimated annual cost of \$65,000 including salary, benefits and transportation allowance. The central office staff member handles plan review, site inspection, and approval letter issuance. IDEM also has 16 inspectors to cover all types of NPDES permits who can be called on to inspect animal feeding facilities in an emergency.

County boards of health or county sanitariums also can respond to problems with livestock feeding operations. Department of Natural Resources conservation officers are also available to respond. The IDEM's emergency response group will react to major incidents such as fish kills. In the course of a year, these "secondary" resources will cover 25 to 50 percent of the inspections and other responses.

C. Iowa

1. Regulatory Authority

The Environmental Protection Division of the Iowa Department of Natural Resources (IDNR) has general authority for environmental protection, including regulation of animal feeding operations. The IDNR has issued NPDES permits since 1978. The State regulations covering animal feeding operations are found in Chapter 65 of the Environmental Protection Commission Section 567 of the *Iowa Administrative Code (IAC)*. There are separate requirements for open feedlots, in which cattle have no shelter other than natural protection, and for totally enclosed, confined feeding operations. The State regulations also establish minimum waste control requirements for all (permitted and non-permitted) animal feeding operations in the State. The minimum waste control requirement for an open feedlot is the removal of settleable solids before wastes are discharged into waters of the State. The minimum waste control requirements for an open feedlot meeting the NPDES permitting criteria is to control wastes such that no discharge occurs except due to precipitation events in excess of the 25 year, 24-hour storm event. The minimum waste control requirement for a totally confined system is no discharge into the waters of the State. The IAC includes ground water in the definition of "waters of the State."

2. Types of Permits

IDNR issues operating and construction permits. Operating permits are required for animal feeding operations that meet the requirements outlined below. The NPDES permit and the operating permit usually are combined if a facility meets the NPDES size requirements and has the potential to discharge to waters of the State. A facility that is expanding its wastewater control facilities or constructing new facilities must have a construction permit.

3. Permit Coverage

An open feedlot with more than 1,000 AUs, or more than 300 AUs and discharging through a man-made drainage system or into waters of the State which flows through the feedlot, must have an operating or combined operating/NPDES permit. An open feedlot is any livestock feeding operation that is not completely enclosed. State regulations prohibit any discharge from totally enclosed operations, so these facilities generally are not required to secure operating or operating/NPDES permits.

An open feedlot that meets the requirements for an operating permit must obtain IDNR approval before beginning construction of a waste control project. Construction permits are also required for completely enclosed confinement operations that utilize an anaerobic lagoon, that house more than 200 AUs and utilize any other type of earthen waste storage facility, or that house more than 2,000 AUs and use a formed waste storage tank.

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4. Number of Permitted Facilities

About 15 NPDES permits have been issued to facilities with more than 1,000 AUs. Twelve of the permits have been issued to beef operations, one to a swine operation and two to beef and swine operations. Iowa keeps no records on the number of State operating or construction permits issued.

5. Resources for Program Administration

The IDNR has 1.7 FTEs devoted to the animal feeding operation permitting program: there are 0.5 FTEs in the central office involved in plan review and permit issuance. The remaining 1.2 FTEs are spread among the six field offices, where they are involved mainly in complaint investigations and corrective actions.

Facility Type	Confined Animal Operations In Iowa	
	Number Of Operations ^{1/} with More Than 1,000 AUs ^{2/}	Number Of Operations with NPDES Permits ^{3/}
Beef	340	12
Dairy	1	---
Swine	2,557	1
Poultry	14	---
Other	---	<u>2 (swine & beef)</u>
Total	2,912	15

1/ Source: U.S. Department of Commerce. 1989 (November). 1987 Census of Agriculture. "Beef" corresponds to USDC's "number of farms with cattle fattened on grain & concentrates sold." "Dairy" corresponds to USDC's "number of farms with inventories of milk cows." "Swine" corresponds to USDC's "number of farms with inventories of hogs and pigs." "Poultry" corresponds to USDC's "number of farms with sales of broilers and other meat-type chickens" and number of farms with inventories of hens and pullets of laying age." **Because Census of Agriculture categories do not correspond exactly to the animal unit categories in the NPDES regulations, the numbers are approximations. For poultry facilities, the numbers from the Census of Agriculture were adjusted to reflect the fact that, on average, broiler farms produce 5-6 "batches" of broilers per year. Thus, the figures given here are estimates of the number of animal units in inventory.**

2/ Some of the operations with more than 1,000 AUs are total confinement systems; State regulations prohibit discharges from total confinement systems

3/ Iowa Department of Natural Resources. 1992

D. Kansas

1. Regulatory Authority

The State of Kansas has administered the NPDES program for CAFOs since 1974. The Kansas Department of Health and Environment (KDHE) has regulatory authority over livestock operations with more than 300 head and livestock operations with the potential to cause environmental degradation. (While the NPDES program uses the terminology "Animal Unit" to establish a unit of measurement for CAFOs, Kansas program officials use the term "head." A head is equal to one animal, regardless of the type of animal discussed.) The permit program for water pollution control facilities serving livestock operations established under the provisions of K.S.A. 65-165 is implemented by K.A.R. 28-18-1 through 4 and K.A.R. 28-16-56a through 63. Under the Kansas program, waters of the State includes subsurface waters.

2. Types of Permits

Kansas issues NPDES individual permits to livestock facilities with capacities of more than 1,000 AUs. The State does not have authority to regulate livestock waste control facilities through a NPDES general permit.

Under State law, the following types of confined livestock feeding operations must be registered with the KDHE:

- Animal feeding operations with 300 or more head of cattle, hogs, or sheep.
- Livestock operations that use wastewater control facilities,
- Operations that present a potential water pollution problem,
- Commercial poultry houses with flocks of more than 1,000 birds, and
- Any other animal feeding operation whose operator elects to come under State regulations.

Operations that present a potential water pollution problem can be identified by, but not limited to, the following:

- (a) open lots fenced and located across or immediately adjacent to creeks, streams, intermittent waterways, or other conveyance channels or devices; and
- (b) discharge to a road ditch, creek, or other conveyance channel that precludes the control of discharged wastewater upon the operator's property.

Once registered, a livestock facility will be issued either a Kansas agricultural and related waste control permit or a certificate of compliance. Facilities that can control and prevent

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discharges to receiving streams are issued permits for their water pollution control facilities. Small livestock facilities that do not use control facilities and do not pose potential water pollution problems are exempt from permit requirements and are issued certificates of compliance.

3. Permit Coverage

Kansas issues NPDES permits for water pollution control facilities to individual operations that have the capacity for more than 1,000 AUs.

Any confined livestock feeding operation that uses a wastewater control facility, or that has capacity for more than 300 head of cattle, hogs, or sheep, or 1,000 head of poultry, or that has a potential water pollution problem must obtain a Kansas agricultural and related waste control permit or certificate of compliance.

4. Number of Permitted Facilities

The table below shows the number of livestock operations with more than 300 AUs and the number of State and/or NPDES permitted operations or operations with certificates of compliance.

Facility Type	Confined Animal Operations In Kansas		
	Number Of Operations With Over 300 AUs 1/	State &/Or Npdes Permitted Operations With Over 300 Head 2/	State Permitted Operations (300 Head Or Less) & Operations With Certificates Of Compliance
Beef	805	586	366
Dairy	24	19	661
Swine	619	480	625
Poultry	24	34	1
Total	1,472	1,119	1,653

1/ Source: U.S. Department of Commerce. 1989 (November). 1987 Census of Agriculture. "Beef" corresponds to USDC's "number of farms with cattle fattened on grain & concentrates sold." "Dairy" corresponds to USDC's "number of farms with inventories of milk cows." "Swine" corresponds to USDC's "number of farms with inventories of hogs and pigs." "Poultry" corresponds to USDC's "number of farms with sales of broilers and other meat-type chickens" and "number of farms with inventories of hens and pullets of laying age." **Because Census of Agriculture categories do not correspond exactly to the animal unit categories in the NPDES regulations, the numbers are approximations. For poultry facilities, the numbers from the Census of Agriculture were adjusted to reflect the fact that, on average, broiler farms produce 5-6 "batches" of broilers per year. Thus, the figures given here are estimates of the number of animal units in inventory.**

2/ Kansas Department of Health and Environment. 1992. Includes operations with permits in process. Poultry operations are based on facilities with over 1,000 head of poultry. While the NPDES program uses the terminology "Animal Unit" to establish a unit of measurement for CAFOs, Kansas program officials use the term "head." A head is equal to one animal, regardless of the type of animal discussed.

3/ Same source as 2/. Includes operations with less than 300 head of cattle or hogs, and less than 1,000 head of poultry.

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Three hundred livestock facilities with capacity of more than 300 head have been issued NPDES permits. KDHE officials estimate that these 300 NPDES permitted operations account for about 80 percent of the fed cattle in the State. Because of the financial and management capabilities of the larger feedlots, most NPDES-permitted operations comply with their permit conditions. Operations with only Kansas agricultural and related waste control permits are estimated to be in compliance approximately 80 to 90 percent of the time.

Because Kansas regulations require State permits for commercial poultry facilities with 1,000 head or more (which is less than 300 AUs), poultry operations with permits is greater than the total number of operations of more than 300 AUs. Kansas requires wastewater control structures for milking parlors at dairy facilities. Since this also applies to small dairy facilities, it explains why the number of permitted dairy facilities is greater than the total number of dairy facilities with over 300 AU.

5. Resources for Program Administration

KDHE has nine full-time employees devoted to the agricultural waste unit. Six work in the field on inspections and compliance, two work in the central office on permit writing and plan reviews, and one provides administrative support. Feedlot inspections/investigations, site appraisals, plan reviews, and permit writing are the most time-consuming aspects of the permitting process. The agricultural waste unit processed 365 new permits last year and received about 560 renewal applications.

E. Nebraska

1. Regulatory Authority

The Nebraska Department of Environmental Quality (NDEQ) has regulated discharges of livestock wastes into the waters of the State in accordance with the NPDES program since 1974. The NDEQ also has regulatory and permitting authority over livestock waste control facilities under State Title 130, "Rules and Regulations Pertaining to Livestock Waste Control." Nebraska has authority to regulate discharges to surface and ground water.

2. Types of Permits

Nebraska requires the operators of livestock facilities that require waste control systems to obtain construction permits before the waste control facilities can be built.

Nebraska has the authority to issue individual NPDES permits to livestock operations for their waste control systems. Although the State has NPDES general permit authority, it has not implemented a general permit for CAFOs. Because all livestock operations that require

waste control facilities must have pre-construction, on-site inspections and must obtain State construction permits, NDEQ officials believe that a general permitting program for livestock waste control systems would not yield any significant benefits.

3. Permit Coverage

Nebraska issues NPDES permits only to livestock operations that discharge or have the potential to discharge animal wastes into the waters of the State. Thus, the necessity for a NPDES permit is determined case-by-case, after a site inspection is completed. The State does not issue NPDES permits to operations that do not discharge or have a potential to discharge into the waters of the State, regardless of their size. One example of a non-discharging operation cited by Department officials is a 32,000-head beef feedlot that is located in an area that does not discharge to waters of the State. This type of facility would not need a NPDES permit. Another example is totally confined livestock feeding operations. Officials contend that, by design, totally confined operations contain all wastes--either in structures below the livestock housing units, or in containment areas such as lagoons--and do not discharge into waters of the State, even in the event of a 25 year, 24-hour storm.

Under State law, a livestock operation must have a waste control facility if the existing or proposed operation allows livestock wastes to:

- Violate or threaten to violate Nebraska Water Quality Standards (Title 117);
- Violate or threaten to violate Nebraska Ground Water Quality Standards (Title 118);
- Discharge into waters of the State; or
- Violate the Nebraska Environmental Protection Act.

The operator is responsible for requesting an NDEQ inspection of the operation to determine whether a waste control facility is needed. If the Department determines a waste control system is necessary, the operator must first obtain a permit before construction starts.

4. Number of Permitted Facilities

A total of 213 livestock facilities have been issued NPDES permits, and approximately 1,100 livestock facilities have been issued construction permits in Nebraska. Department officials say that there are many livestock operations in the 1,000-5,000 AU range that do not have NPDES permits because they do not discharge and do not have the potential to discharge.

The following table summarizes the number of Nebraska livestock feeding operations with more than 300 AUs and the number of livestock feeding operations with more than 300 AUs that have NPDES permits or have NPDES permits in process. The table does not include the approximately 1,100 livestock operations that have obtained construction permits because information on the type and size of these facilities is not available.

Facility Type	Confined Animal Operations In Nebraska	
	Number Of Operations With Over 300 AUs 1/	Number Of Npdes Permitted Operations With Over 300 AUs 2/
Beef	1,754	156
Dairy	23	3
Swine	1,907	3
Broilers	2	0
Layers	24	0
Total	3,710	162

1/ Source: U.S. Department of Commerce. 1989 (November). 1987 Census of Agriculture. "Beef" corresponds to USDC's "number of farms with cattle fattened on grain & concentrates sold." "Dairy" corresponds to USDC's "number of farms with inventories of milk cows." "Swine" corresponds to USDC's "number of farms with inventories of hogs and pigs." "Broilers" correspond to USDC's "number of farms with sales of broilers and other meat-type chickens." "Laying Hens" corresponds to USDC's "number of farms with inventories of hens and pullets of laying age." **Because Census of Agriculture categories do not correspond exactly to the animal unit categories in the NPDES regulations, the numbers are approximations. For poultry facilities, the numbers from the Census of Agriculture were adjusted to reflect the fact that, on average, broiler farms produce 5-6 "batches" of broilers per year. Thus, the figures given here are estimates of the number of animal units in inventory.**

2/ Nebraska Department of Environmental Quality. 1992. Does not include the 1,100 facilities with construction permits.

5. Resources for Program Administration

Because the NDEQ recently combined the agricultural and industrial NPDES permitting programs, the number of staff devoted to the permitting of livestock waste control systems has declined from 4.5 to 2.5 FTEs.

F. EPA Region VI

1. Regulatory Authority

EPA Region VI developed a NPDES general permit for CAFOs under the authority of the Clean Water Act, which requires CAFOs with point-source discharges of pollutants to waters of the United States to obtain a NPDES permit (40 CFR 122.23 and 122 Appendix B). EPA's storm water program requires facilities with storm water discharges associated with industrial activity to obtain a NPDES permit. Under this program, published in the November 16, 1990 Federal Register, CAFOs with over 1,000 AUs must obtain NPDES permits as facilities with industrial discharges that have national effluent guidelines for storm water. CAFOs with over 1,000 AUs are subject to the effluent guidelines in 40 CFR 412.

2. Types of Permits

The NPDES general permit applies to existing facilities that notify EPA of their intent to be covered by and adhere to permit requirements. Notification is accomplished by submitting a notice of intent (NOI). A NOI form notifies the permitting authority of the permittee's intent to be covered by and comply with a general permit. A copy of the Region VI form is provided in Appendix B. Facilities expanding operations beyond the number of animals specified in 40 CFR Part 122 Appendix B(a), will be required to submit a new NOI prior to construction of the expansion. For new CAFO facilities, there must be a finding of no significant environmental impact (FONSI) or a completed Environmental Impact Statement for the facility to gain coverage under the general permit.

EPA Region VI has authority to grant individual permits to CAFOs. The Region intends to issue individual permits to facilities that request them, or that are required to have them as determined by EPA, because of water quality standards violations.

3. Permit Coverage

The NPDES general permit may cover all new and existing CAFOs meeting the size and discharge requirements of 40 CFR 122 Appendix B. This includes the following facilities:

- 1) More than 1,000 AUs; or
- 2) 300 to 1,000 AUs that discharge via a man-made conveyance or directly into waters of the United States.

Only facilities that discharge in other than a 25 year, 24-hour storm event must obtain a permit.

A general permit was issued for facilities in Louisiana, New Mexico, Oklahoma, and Texas. Facilities in Arkansas, which is also in Region VI, are issued permits by the State of Arkansas, which is authorized to administer the NPDES program.

4. Number of Permitted Facilities

A limited number of facilities are covered by individual NPDES permits in the EPA Region VI States of Louisiana, New Mexico, Oklahoma and Texas. While up to 150 facilities had been permitted in the early 1980s, fewer than 10 permits have been administratively continued and are currently in force. For most of the facilities permitted in the early 1980s, the Region has no administrative records of reapplications to support the continuation of the expired permits. Region VI staff estimate that there are approximately 1,000 CAFOs in the four States that should be covered by NPDES permits.

5. Resources for Program Administration

EPA Region VI did not have any FTEs officially dedicated to the CAFO NPDES program. However, approximately one and one half FTEs were used to write the general permit and approximately four FTEs will be used for compliance activities.

G. Washington

1. Regulatory Authority

The Washington Department of Ecology (WDOE) has regulatory authority for CAFOs, but has not systematically issued NPDES permits to them. A few individual NPDES permits issued sporadically in the late 1970s and 1980s have been administratively continued. WDOE is developing a NPDES general permit for dairy operations. Besides discharges to surface water, WDOE has authority to regulate discharges to ground water. The authority for such actions is found in the Water Pollution Control Act (Chapter 90.48 RCW). The words "waters of the State," when used in the Water Pollution Control Act, include underground waters (RCW 90.48.020), giving WDOE authority to regulate discharges to ground water.

On May 6, 1993, Substitute Senate Bill 5849 (SSB 5849) was signed into law. This legislation establishes a dairy waste management program that combines the issuance of discharge permits with technical assistance from local conservation districts. Essentially, those farms meeting the federal definition of a CAFO or discharging directly to ground water would be required to obtain NPDES/State waste discharge permit coverage. Conservation District technical assistance is formally made available for dairies to develop a conservation plan to achieve compliance.

2. Types of Permits

Under the proposed NPDES permit program, most dairy operations that require permits would be covered by the general permit. However, dairy operators who believe there are fundamentally different factors in their cases may apply for individual NPDES permits.

3. Permit Coverage

Under Substitute Senate Bill 5849, the NPDES general permit would apply only to commercial dairies that meet the federal definition of a CAFO or directly discharge to ground

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water. Any dairy with an implemented conservation plan from the local conservation district would be administratively excused from obtaining general permit coverage, as long as no future water quality problems occur. Permit coverage will be granted to non-complying dairies, along with a timetable for taking the actions necessary to gain compliance. In addition, dairies that inspections show to be in compliance with the general permit provisions would not have to obtain permit coverage. Farms with relatively minor problems will continue to be addressed under the Agricultural Compliance Memorandum of Agreement (MOA) program. Under this program, dairies that cause water quality problems are referred to the local conservation district to develop and implement a conservation plan. Under the proposed NPDES permit program, these dairies would be required to obtain NPDES permits only if they stop complying voluntarily with conservation plans.

4. Number of Permitted Facilities

Approximately eight NPDES permits were issued to CAFOs in the late 1970s and early 1980s, and have been administratively continued. The proposed general permit program would focus on covering up to approximately 750 dairy farms that are not fully implementing conservation plans, but are required to obtain permit coverage. This represents approximately two-thirds of the dairies in the State, which produce the majority of the State's dairy waste.

5. Resources for Program Administration

Six FTEs are dedicated to Washington's dairy waste control program. There are 5 FTEs among the four regional offices, and 1 FTE in the central office. The staff in the regional offices investigate complaints, inspect sites, and perform enforcement actions.

H. Wisconsin

1. Regulatory Authority

The Wisconsin Department of Natural Resources (WDNR) has regulated livestock feeding operations under the Wisconsin Pollutant Discharge Elimination System (WPDES) since 1984. The Department has regulatory authority over all operations with more than 1,000 AUs and smaller operations that are designated as significant sources of pollution. The authority to regulate CAFOs is contained in Chapter 147 of the Wisconsin Pollution Discharge Elimination Law; the regulations are contained in Chapter NR 243 of the Wisconsin Water Pollution Control Regulations. The regulations emphasize that only large operations (>1,000 AUs), or those causing significant pollution are subject to regulation. The regulations state

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that it is not the program's intent to require all the animal feeding operations in Wisconsin to obtain a WPDES permit.

The WDNR has authority to regulate discharges to ground water, as well as to surface water. The WDNR does not have the authority under Chapter NR 243 to pursue odor or other nuisance complaints unless a discharge or water quality violation has occurred. Nuisance suits are a local zoning matter in Wisconsin, and counties and townships are encouraged to adopt zoning rules to avoid potential nuisances. Any livestock feeding operation that is following standard agricultural practices in an area zoned for agriculture is generally shielded from nuisance suits.

2. Types of Permits

Wisconsin has NPDES general permit authority, but it does not have a general permit for CAFOs; WDNR issues only individual WPDES permits to CAFOs. Because of the small number of large operations (>1,000 AUs) in the State, and because very few small operations are designated as significant sources of pollution, WDNR staff do not see any advantage to a general permit.

3. Permit Coverage

Under State law, all animal feeding operations with 1,000 or more AUs must have permits, even though there may be no threat of a discharge. Other animal feeding operations may be permitted if they are designated a significant source of pollution. The designation is made only after a complaint is registered and required enforcement and compliance methods have been exhausted.

4. Number of Permitted Facilities

There are 43 WPDES-permitted facilities in Wisconsin. Of that group, 41 are operations with more than 1,000 AUs, and the remaining two were designated as significant sources of pollution and permitted as part of a water quality enforcement action. Nineteen of the 41 permits covering the large facilities are issued to a single corporation. The State permitting staff believe that all operations with more than 1,000 AUs are covered by a WPDES permit.

5. Resources for Program Administration

The annual State budget for the livestock permitting program is \$303,721, which includes staff salary, fringe benefits, and support expenses. There are approximately five FTEs involved in

the livestock wastewater control: 1.5 FTEs in the central office, 1 investigator in each of three district offices, and 1 FTE spread among the other three district offices. In addition, other WDNR staff (e.g., fish and game wardens) are on call at all hours to respond to emergencies.

II. PERMITTING PROCESS

This chapter presents the major components of each States' permitting process. They consist of: unpermitted concentrated animal feeding operation (CAFO) identification, screening tools, public comment provisions, and inspection requirements. While the key components of each program are basically the same, different States emphasize different components.

A. Arkansas

1. Unpermitted CAFO Identification

With its limited staff of 2.5 FTEs, the Arkansas Department of Pollution Control and Ecology (ADPCE) generally relies on NPDES inspectors' facility visits, nuisance complaints, fish kill reports, and the efforts of the major livestock contractors to identify the State's unpermitted facilities. ADPCE staff report that dairy facilities are the most common type of confined livestock operation without liquid waste management system permits. Conversely, large swine and poultry facilities that are under contract with major processing companies usually have permits. The major contractors prefer that their producers have liquid animal waste management system permits; some even specify a permit as a condition of the contract. The contractors tend to police their own waste control systems to ensure that they remain in compliance and have the proper permits.

2. Screening Tools

Unlike some State agencies, the ADPCE has not developed screening tools to rank unpermitted livestock facilities that should be targeted for permitting. However, the Department's "Enforcement Tracking List" records reported violations and the actions taken against animal feeding facilities, including violations associated with liquid animal waste management.

3. Public Comment Provisions

Arkansas will have a 30-day public comment period for its draft NPDES general permit, if and when it is publicly noticed. During this time, any person may request a public hearing. All comments received during the public comment period and public hearing will be considered in the issuance of the final general permit.

Under Arkansas Regulation No. 5, "Liquid Animal Waste Management Systems," any operator who plans to submit an application to construct, operate, or modify a confined animal operation using a liquid waste disposal system must first publish a public notice of the

application. The notice must be published in a newspaper with circulation in the county or counties of the proposed operation, and it must appear no less than once per week for two consecutive weeks. The notice must be published on a form provided by the ADPCE, which must be provided with a copy of the notice. The ADPCE provides a copy of the public notice to the county quorum court or to the city zoning authority, whichever is applicable. Applicants are responsible for all expenses associated with public notices. Each notice must provide the following information:

- Type of facility to be constructed or operated;
- Type of waste generated, and a description of the waste treatment, handling, or disposal processes;
- Legal description of all properties to be used in the treatment, handling, or disposal of wastes; and
- Road and street description of all properties to be used in the treatment, handling, or disposal of wastes.

If the Department decides a public hearing is necessary, it will schedule one and will notify the applicant and all persons who submitted comments.

4. Inspection Requirements

Arkansas' draft NPDES general permit does not require an initial facility inspection. However, new or proposed facilities must submit with the Notice of Intent (NOI) a certification from a professional engineer or Soil Conservation Service (SCS) representative that the facility was constructed in accordance with approved plans and specifications and under the terms and conditions of an ADPCE construction permit. The draft general permit also has provisions for annual site inspections that must be performed by the permittee. Records documenting significant observations made during the annual inspections must be retained by the permittee for at least three years.

The current permitting process usually begins when an interested operator contacts the ADPCE. The ADPCE sends the operator an application which, among other things, reminds the operator that designs and waste management plans must be in accordance with SCS recommendations. A waste management plan must be developed and approved by the SCS, a professional engineer, or a water quality technician. Construction plans also must be approved by a professional or SCS engineer. The completed application, along with waste management, site management, and construction plans must be submitted to the ADPCE. Because the Department's staff resources are limited, the application process does not include a post-construction, on-site inspection of the facility's liquid waste management system.

Ideally, after livestock facilities obtain liquid waste management system permits, the ADPCE inspects them every year. Once again, staff limitations (there is one-half FTE assigned to enforcement and compliance) have prevented the Department from keeping current on scheduled inspections.

B. Indiana

1. Unpermitted CAFO Identification

Because the Indiana Department of Environmental Management (IDEM) lacks resources for inspections to identify unapproved or discharging livestock feeding operations, IDEM must rely on neighbors and the general public to report compliance problems and discharges. One IDEM staff member spends about 40 percent of his time on outreach activities to increase public awareness of the State's confined feeding operation approval program. IDEM staff have made presentations to insurance companies, lenders, the SCS, extension agents, and producer groups. The efforts directed at insurance companies and agricultural lenders have proven to be very effective in bringing unapproved operations into compliance, because most lenders and issuers now require a letter of approval before granting a loan or insurance coverage. IDEM staff view these outreach activities as an effective way to achieve compliance in the face of limited resources.

2. Screening Tools

Indiana issues letters of approval to livestock operations. Letters of approval are issued based on the size of a facility and its location. The issuing office has determined how far a facility must be from bodies of water, wells, neighboring residences, and public areas before the approval letter will be issued. It will be flexible about the separation distances, if a facility's neighbors approve. The office is even more flexible about separation distances required of existing facilities.

3. Public Comment Provisions

Because the Indiana confined feeding operation approval program is not a permitting program, it has no public comment provisions.

4. Inspection Requirements

There is no scheduled inspection program. Inspections are conducted in response to complaints or water quality violations (i.e., fish kills). Surprise inspections of unapproved facilities are made only occasionally. Inspections are not integral to the program because peer pressure is responsible for bringing most operations into compliance. Operators who are in compliance often report neighbors who are not. The high level of public awareness about the program means that local residents are also likely to report operations that are candidates for inspection.

C. Iowa

1. Unpermitted CAFO Identification

Because it lacks resources, the Iowa Department of Natural Resources (IDNR) must depend on voluntary compliance by operators. Because of resource limitations and political concerns, IDNR staff do not look for non-permitted or discharging facilities. The IDNR relies heavily on the educational efforts of producer organizations to inform operators of the necessity of permit coverage. Iowa livestock producer organizations have become very active in trying to bring their members into compliance. For example, the Iowa Pork Producers Association devoted a portion of its magazine's November 1992 issue to environmental issues affecting hog operations, including a description of the animal feeding operation regulations. The IDNR has developed close working relationships with producer organizations at the national and State level, and believes that producer groups have realized the importance of protecting the environment and will no longer defend a producer who is not in compliance.

2. Screening Tools

Operating permits are issued based on the size and type of the facility and the type of waste control system it uses. Iowa issues NPDES permits to facilities that meet the size requirements or that have a history of discharges.

3. Public Comment Provisions

The State operating and construction permits do not have public comment provisions. NPDES permits have a 30-day public notice period. Applicants must post notices in public places near their livestock facilities and publish notices in local newspapers and periodicals. A public hearing will be held if there is significant public interest during the public notice period.

4. Inspection Requirements

Because of staff shortages, there is no scheduled inspection program for CAFOs in Iowa. Operations holding NPDES permits are inspected every five years when the permit is renewed. Unpermitted operations are inspected only as the result of a complaint or a water quality violation.

D. Kansas

1. Unpermitted CAFO Identification

By law, any livestock facility that uses a wastewater control structure, discharges, or has the potential to discharge livestock wastes into waters of the State, must have a permit. Identifying these types of unpermitted livestock facilities can be difficult. Officials in the agricultural waste unit usually rely on unannounced visits to unpermitted facilities, nuisance complaints, and fish kill reports to identify livestock operations that are not in compliance.

2. Screening Tools

The Kansas Department of Health and Environment (KDHE) believes that many livestock facilities in the State require permits but do not have them. The Department suggests that its inspectors consider such criteria as facility size, location, potential for discharges, distances to water resources and residences, and complaints when assigning priorities to the identification and permitting of unpermitted livestock operations. Unpermitted operations that have the potential to cause or are currently considered to cause human health effects, aquatic damage, or nuisance complaints are generally given top priority in the permitting process.

3. Public Comment Provisions

The KDHE places draft agricultural waste control permits on public notice for 30 days. The Department will not issue a permit or give approval to start construction until the 30-day notice period has expired. All proposed NPDES permits are also placed on public notice for 30 days. Upon request, a public hearing may be held to consider significant objections.

4. Inspection Requirements

The agricultural waste control permit procedure in Kansas usually begins with the applicant's request for information on the design and permitting of confined livestock operations. A site appraisal by the KDHE follows and if approved, the applicant then submits a registration and permit application with the appropriate fee. If required, releases from adjacent residents giving their permission for the applicant to construct livestock feeding and water pollution control facilities also must be submitted to the KDHE. The submission of a general information and operation plan to the Department is the next step in the permitting process. Construction plans are then presented for KDHE review and approval. The KDHE makes the draft permit available for public comment for 30 days. After the comment period, the Department issues the permit and gives its approval for facility construction. Upon completion of the waste treatment facility, it conducts a post-construction inspection. This

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inspection ensures that the waste structure(s) was built according to approved plans and provides the Department with an accurate record of existing waste-control and operational structures. After the completion of a satisfactory post construction inspection, the facility is approved to begin operating.

Kansas has a scheduled inspection program for livestock feeding facilities that depends upon the size of operation, type of permit, and compliance history. NPDES-permitted livestock facilities are normally inspected once a year, more often if a problem is identified. If a NPDES-permitted facility has a poor compliance history, it may be inspected every six months; facilities with good compliance records may be inspected only every two years. State permitted livestock operations are inspected every two years unless a problem occurs; then the inspections increase to once a year. Livestock operations with certificates of compliance are inspected every four years, and inactive permitted operations are inspected every five years.

E. Nebraska

1. Unpermitted CAFO Identification

Nebraska Department of Environmental Quality (NDEQ) staff do not seek unpermitted concentrated animal feeding facilities. Instead, they concentrate on processing permit applications and enforcing livestock waste control permit requirements. Unpermitted CAFOs are usually identified by livestock producer organizations, which are the operator's primary source of livestock waste control information. Such organizations have helped to increase awareness of the permitting process and the importance of permits in Nebraska.

2. Screening Tools

Criteria used to assign priorities to the permitting of livestock waste control systems in Nebraska include the potential for a facility to discharge wastes, topography, and location of the facility in respect to waters of the State. In general, new NPDES permits are issued based on an individual facility's potential to discharge animal wastes into waters of the State. In Nebraska, the potential for discharge is usually determined by an on-site inspection.

3. Public Comment Provisions

Every NPDES application and resulting decision to issue or deny the permit must be put on public notice. Notices must appear in a daily or weekly newspaper that circulates in the area of the proposed livestock waste control facility. Copies of public notices will be mailed to applicants and other persons who request them. There is a 30-day public comment period in

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which individuals or groups can submit written comments or request a public hearing concerning the proposed livestock waste control facility.

Public comments and other information received during the 30-day period that appear to raise substantial issues concerning a permit may persuade the Department to prepare a new draft. In this instance, the new draft permit will be republished for additional public comment. If no major issues are raised and the NDEQ issues a NPDES permit, the Department must respond in writing to all the public comments received.

4. Inspection Requirements

As previously noted, any livestock operation that needs a waste control facility must obtain a construction permit from the NDEQ. The need for a waste control facility is determined by an on-site inspection of new and existing facilities. This is the only required inspection for the issuance of a State construction permit in Nebraska.

"Large" livestock operations issued NPDES permits are usually inspected every year, but they can be inspected two or more times per year depending upon the operator's compliance record.¹ Facilities with compliance problems are inspected frequently until the problems are corrected. In 1991, the NDEQ conducted 298 inspections of livestock feeding operations' waste control systems. Officials report that a more structured inspection program may develop as the agricultural waste control program is integrated into the industrial and municipal waste control programs. This integration would allow all types of NPDES inspections in an area to be completed in a single trip. The Department does not have a scheduled inspection program for small livestock facilities.

F. Region VI

1. Unpermitted CAFO Identification

EPA Region VI does not have a specific agenda for identifying unpermitted CAFOs. However, throughout the development of the general permits, a series of public meetings were held regarding permit provisions.

¹ Neither Title 130 nor Nebraska NPDES permits have provisions for post-construction inspections. However, interviewees with the NDEQ report that "large" livestock operations are inspected regularly but they declined to define "large".

2. Screening Tools

No formal screening tools or criteria will be used by Region VI. However, the Region believes that violations of water quality standards covered by unauthorized releases from CAFOs will be reported by the public. Furthermore, the States in Region VI have compliance tracking and inspection systems, and they are expected to provide EPA with information concerning water quality violations.

3. Public Comment Provisions

EPA received considerable public comment about the general permits (issued on February 8, 1993) since public notice of the permits first appeared in July, 1992. A series of public meetings were held in the States to be covered by the proposed permits, and public comments were accepted by the Agency for at least six weeks. In fact, the public comment period was extended in some areas, and public comments were still being received after the formal comment period ended.

Some CAFO facilities--which will not be covered by the general permits at the discretion of EPA or at an individual operator's request--will be required to obtain individual permits. Prior to individual permit issuance, there will be a public comment period of at least 30 days.

4. Inspection Requirements

The NPDES general permits include no requirements or provisions for site inspections prior to permit coverage for existing facilities. However, EPA does require that access to permitted facilities be granted for inspections at reasonable times. Inspections will likely result from reports of violations by operators, water quality problems, and complaints from the general public.

Although there are no provisions for specific periodic (e.g., annual) inspections by EPA, one of the permit requirements is that the operator conduct an annual inspection. This inspection should verify that the description of potential pollutant sources is accurate, that the drainage map kept on site reflects current conditions, and that the controls specified in the pollution prevention plan are adequate. Records documenting the inspections and the findings must be kept on site and made available upon request.

G. Washington

1. Unpermitted CAFO Identification

Under the proposed NPDES general permit program, all Washington commercial dairies that meet the definition of a CAFO, directly discharge to ground water, or support more than 200 mature animals would be required to submit a Notice of Intent (NOI) requesting general permit coverage. Those farms supporting less than 200 mature animals would be permitted if a site inspection determines that they are a significant contributor of pollutants to surface or ground water.

2. Screening Tools

WDE has developed a complaint-driven screening process to determine which dairies need permit coverage. Five full-time Regional staff positions are dedicated to complaint response activities. WDE receives 250 agricultural water quality complaints each year. The majority of these complaints concern commercial dairy farms. In addition, ambient and intensive water quality survey data, watershed plans, and other sources of information may trigger site inspections without the receipt of a formal complaint.

Under a CWA Section 319 grant, Soil Conservation Service staff are completing a survey of dairy farms in the State's most heavily dairied counties to assess farm-specific dairy conservation planning and implementation. This screening mechanism is providing valuable baseline data regarding dairy waste management.

3. Public Comment Provisions

Washington has received much public input since it began to develop the general permit. Copies of the draft permit were sent to all commercial dairies in the State, along with meeting announcements and other related information. Display ads published twice in nine newspapers announced the public meetings which were held across the State. Five public informational meetings concerning the draft permit were attended by 800 people, and the draft permit was presented to the annual Washington State Dairy Federation conference. The State revised the draft permit in response to the comments received at the public meetings and submitted it to EPA for review. After EPA approval, the proposed NPDES general permit had a formal 50-day public comment period from July 1, 1992 to August 19, 1992. An announcement of the comment period and additional public hearings was sent to all 1,200 commercial dairy farmers, interested government agencies, Indian tribes, adjacent States, and the Canadian province of British Columbia. A copy of the revised permit was mailed to all the commercial dairy farmers and interested parties, and display ads were published twice in nine newspapers across the State. Five formal public hearings were held to discuss the revised permit, and based on the response, additional public hearings are scheduled for 1993.

4. Inspection Requirements

Currently, there is no scheduled inspection program for dairies using wastewater control facilities. Under the proposed general permit, the inspection requirements would be site-specific, based on the resources available to WDOE.

H. Wisconsin

1. Unpermitted CAFO Identification

Because there are few large animal feeding operations in the State, the Wisconsin Department of Natural Resources (WDNR) does not have a formal process to identify unpermitted CAFOs. DNR staff maintain an informal monitoring network with other State and county agencies, university staff, and environmental consultants to keep up-to-date on potential large operations. The WDNR staff also monitor local newspapers' announcements of the construction of large livestock feeding operations. State permitting staff believe that all operations with more than 1,000 AUs are covered by a Wisconsin Pollutant Discharge Elimination System (WPDES) permit.

2. Screening Tools

WDNR does not use a formal screening tool to rank the environmental threat posed by an animal feeding operation. The WPDES permitting program applies to any operation with more than 1,000 AUs. WDNR has been able to issue permits to all livestock operations meeting the size requirement because there are few large livestock operations in the State.

3. Public Comment Provisions

All WPDES permits are subject to a 30-day public notice period before issuance. A public hearing will be scheduled if WDNR staff believe there is enough interest, or if at least five people request a hearing during the public notice period. The public hearing is handled by WDNR legal counsel, and any objections raised at the hearing are answered by the permitting staff. If necessary, changes are made to the permit requirements in response to concerns raised at the hearing.

4. Inspection Requirements

WDNR does require a site inspection before the construction of a CAFO can begin. However, WPDES permits do not have inspection requirements, and WDNR does not have a scheduled inspection program for CAFOs. CAFOs are inspected by a district investigator if a complaint is registered, or at the discretion of the local USDA or county representative. WDNR staff estimate that about 75 percent of the CAFOs holding WPDES permits are inspected every year.

III. ENFORCEMENT

Authority to levy fines, procedures for identifying and correcting permit violations, and penalties vary among the programs surveyed. This chapter addresses these general enforcement issues.

A. Arkansas

1. Authority to Levy Fines

In accordance with the provisions of the Arkansas Water and Air Pollution Control Act (Act 472 of 1949, as amended, ARK. Code Ann. 8-4-101 et seq.), and the Clean Water Act (CWA) (33 U.S.C. 1251 et seq.), NPDES-permitted CAFOs are prohibited from discharging process wastewater. As specified in Arkansas's draft NPDES general permit (Part III(B)), criminal and/or civil penalties can be assessed against any person who violates ~~any provision~~ of Act 472.

Section 8-4-103 (b) of Act 472 authorizes the Arkansas Department of Pollution Control and Ecology (ADPCE) to institute civil actions to compel compliance with any rules, regulations, orders, or permits associated with the Act. The ADPCE also has the authority to assess civil penalties for each violation of the Act. Furthermore, the ADPCE is authorized to recover payment to the Arkansas Game and Fish Commission for any loss or destruction of wildlife, fish, or other aquatic life.

2. Procedures for Identifying and Correcting Violations

The ADPCE primarily relies on scheduled inspections, complaints, property transfers, or fish kill reports to identify violations of liquid animal waste management system permit conditions. If an operator is found in violation of permit conditions, formal corrective actions generally are initiated immediately. A warning letter is usually mailed to the operator. It specifies a specific number of days in which the waste facility must be returned to compliance. If the letter fails to produce satisfactory results, a fine will be levied and collected by the Department. The ADPCE maintains an extensive "Enforcement Tracking List" that provides information on facility permit numbers, types of violations, inspection dates, dates and types of actions taken, operators' responses, and dates that the violations were resolved. The November 1992 Enforcement Tracking List shows that actions for violations of Act 472 were initiated against 59 facilities.

Besides levying fines, the ADPCE has instituted moratoriums on the issuance of new liquid animal waste management system permits in certain watersheds until existing facilities comply with permit conditions. The Department has also threatened to revoke livestock operating permits and has notified contractors in attempts to remedy some permit violations.

3. Penalties

Part III(B) of Arkansas' draft NPDES general permit lists two types of penalties for violations of permit conditions.

Criminal penalties of imprisonment for up to one year and/or a fine of \$25,000 can be imposed on anyone who violates any provision of Act 472 (misdemeanor). Imprisonment of up to 5 years and/or fines of up to \$50,000 can be imposed on any person who knowingly violates any provision of Act 472 thereby creating a substantial likelihood of adversely affecting human health, animal or plant life, or property (felony). Any person found guilty of purposefully causing pollution not permitted by law, and thereby placing another person in imminent danger, is subject to imprisonment for up to 20 years and/or a fine of up to \$250,000.

Civil penalties of up to \$10,000 per violation can be assessed against any person violating any provision of Act 472. The Department can also recover all costs, expenses, and damages that any State agency may incur while enforcing the Act.

B. Indiana

1. Authority to Levy Fines

Indiana Code section 13-1-5.7 (6) gives the Indiana Department of Environmental Management (IDEM) authority to impose penalties for violations of Chapter 5.7 (Confined Feeding Control Law) of the Water Pollution Control Law. Formal enforcement actions are administered through the court of competent jurisdiction by the IDEM enforcement section.

2. Procedures for Identifying and Correcting Violations

To maintain compliance with the approval program, IDEM depends on operators to abide by the terms of the approval letter they sign. If an operator violates the terms of the approval letter or causes a discharge, IDEM depends on grassroots actions for enforcement. For IDEM to identify a violation, a complaint must be registered by a neighbor or other affected party. Complaints usually are received by the county board of health or county sanitarium, who refer them to IDEM's central office. IDEM has even responded to a situation reported by a television news crew covering a fish kill. To document a violation, IDEM staff refer the complaint to the county sanitarium, the local conservation officer, or to the IDEM emergency spill group, if appropriate. Once the problem is documented, the IDEM livestock program staff become involved. IDEM staff report that in most cases a phone call will resolve the problem. Sometimes, however, a site inspection is warranted and may result in restrictions being placed on the operation of the facility. If a second inspection reveals that the violation is continuing, stronger enforcement actions follow.

In general, the IDEM grants amnesty to existing operations that voluntarily come under the approval program and to unapproved, existing operations identified by unannounced site inspections. However, in the case of a water quality violation, enforcement begins immediately for the violation and for the lack of an approval letter. IDEM has also taken actions to prevent the construction of facilities that are proceeding without State approval.

3. Penalties

Indiana Code section 13-7-13 specifies civil penalties of up to \$25,000 per day for any violations of the provisions of the Environmental Management Act. Anyone who intentionally or negligently violates the Act commits a Class D felony, which is punishable by a fine of between \$2,500 and \$25,000 a day. A subsequent conviction for negligent violation carries a maximum fine of \$50,000 per day of violation. Any person who makes a false statement on an application or report, or who tampers with a monitoring device, is subject to a fine of up to \$10,000. In 1992, two operations were fined \$18,000 each. IDEM staff believe that four well-publicized enforcement actions per year (one in each corner of the State) are effective in encouraging widespread compliance.

C. Iowa

1. Authority to Levy Fines

Iowa Code section 455B.109 authorizes the assessment of administrative penalties for minor violations of the Iowa Environmental Quality Act or any rules, orders, or permits issued pursuant to it. The administrative penalties are processed through the legal services division of the Iowa Department of Natural Resources (IDNR). In addition, IDNR may ask the attorney general to institute legal proceedings to enforce the civil penalty provisions provided in the water quality section of the Iowa Environmental Quality Act (IC 455B.191). The attorney general also may take independent legal action for violations of State water quality standards.

2. Procedures for Identifying and Correcting Violations

Because of staff shortages, there is no scheduled inspection program for CAFOs in Iowa. Operations holding NPDES permits are inspected every five years when the permit is renewed, but other operations are inspected only as a result of complaints or water quality violations. The IDNR receives about 450 complaints a year relating to animal feeding operations; they are investigated by IDNR staff located in six field offices or by county sanitariums. The IDNR's small field staff, which is responsible for all environmental

programs limits, the number of successful actions that are brought for animal waste rule violations.

3. Penalties

The IDNR can levy administrative penalties of up to \$10,000 a day for minor violations of livestock wastewater permit provisions. IDNR staff report that assessing even a small administrative penalty is very effective in bringing an operation into compliance. Civil penalties of up to \$5,000 a day may be levied for permit violations. In the case of a violation caused by negligence, the maximum penalty is \$25,000 for each day of violation and/or imprisonment for one year. The maximum penalty for a subsequent conviction of negligent violation is \$50,000 per day of violation and/or two years imprisonment. In addition, the fisheries bureau may also issue a fine if a discharge causes a fish kill.

D. Kansas

1. Authority to Levy Fines

Under the Kansas Wastewater Discharge Control Law section 65-170, it is the duty of the director of the Division of Environment within the Kansas Department of Health and Environment (KDHE) to investigate and report all matters relating to the pollution of the waters of the State that come before the Secretary of Health and Environment for investigation or action. Suits under the provisions of the Kansas Wastewater Discharge Control Law are brought by the attorney general.

2. Procedures for Identifying and Correcting Violations

Agricultural waste unit employees generally rely on staff visits, complaints, and property transfers to identify livestock facilities that are violating waste control permit conditions. While the Department can initiate investigations and report permit violations to the State attorney general, officials prefer to work with the livestock operators to resolve problems. In many cases, fines levied for noncompliance leave the operator with little money to correct the problem.

3. Penalties

Under the Kansas Wastewater Discharge Control Law (Section 65-167), penalties of not less than \$2,500 and not more than \$25,000 will be assessed against anyone convicted of willfully or negligently discharging sewage ² into any waters of the State without a permit.

Any person found guilty of knowingly making a false statement, representation, or certification in any document filed or required to be maintained under the provisions of K.S.A. 65-161 to 65-171h, will be fined between \$25 and \$10,000.

Civil penalties of up to \$10,000, in addition to any other penalties provided by law, can also be levied for violating the following:

- Sewage discharge permits,
- Effluent or water quality standards,
- Filing requirements,
- Reporting, inspection, or monitoring requirements, or
- Orders or requirements from the secretary of health and environment.

Every day a violation continues is considered a separate violation carrying a maximum penalty of \$10,000.

E. Nebraska

1. Authority to Levy Fines

Chapter 15 of the Nebraska Livestock Waste Control Regulations specifies that failure to comply with livestock waste control regulations may be grounds for enforcement proceedings or injunctive relief by the county attorney or State attorney general. According to Nebraska Department of Environmental Quality (NDEQ) officials, the State attorney general's office has a staff member assigned to pursue cases at the State or county levels for the Department.

² §65-164(b) Defines "sewage" as any substance that contains any of the waste products or excrementitious or other discharges from the bodies of human beings or animals, or chemical or other wastes from domestic, manufacturing or other forms of industry

2. Procedures for Identifying and Correcting Violations

The NDEQ relies primarily on complaints and fish kill reports to identify livestock facilities that are violating their waste control permits. Operators of livestock facilities that violate their permits are usually first sent a letter of warning, in which they are asked to remedy the violation(s) and resubmit waste management plans for review. In most instances, this is all that is necessary to return permitted livestock facilities to compliance. However, if these measures do not work, the problem is turned over to the attorney general's staff for enforcement action.

Under State Title 130, the NDEQ may also revoke, modify, or suspend construction permits for any of the following:

- Allowing a discharge of livestock wastes into waters of the State, unless NPDES permitted;
- Violation of State surface water quality or ground water quality standards;
- Obtaining approval by misrepresentation or failure to disclose all relevant facts;
- Refusal to allow the NDEQ access to the livestock waste control facility or to sample waste sources or surface or ground water; or
- Failure to operate and maintain facility as specified in permit.

3. Penalties

Specific monetary penalties are not addressed in Nebraska's Livestock Waste Control Regulations, Ground Water Protection Act, or NPDES Permit Regulations. Nebraska's NPDES permit conditions specify that the failure to comply with permit requirements may be grounds for administrative action, or enforcement proceedings including injunctive relief. Furthermore, permittees who violate any terms or conditions of their permit or obtain their permits by misrepresentation may have their permits modified, revoked and reissued, or terminated.

F. Region VI

1. Authority to Levy Fines

The authority to pursue civil and criminal enforcement actions, including levying fines against operators who violate their permits, is granted under Section 309 of the CWA. Section 309 provides authority for both civil and criminal actions against operators violating the provisions of their permits.

2. Procedures for Identifying and Correcting Violations

Permit violations will likely be brought to EPA's attention primarily by operators, public complaints, and instances of water quality degradation. Region VI has no specific plans for routine inspections to identify violations, although such plans could be developed in the future.

3. Penalties

The CWA provides that any facility operator who willfully or negligently violates permit conditions or limitations is subject to a fine of not less than \$2,500 or more than \$25,000 per day of violation and/or by imprisonment for not more than one year. The Act also provides that an operator who knowingly makes any false statements or representations in any record, report, or other document, ~~may be punished by a fine of not more than \$10,000 per violation and/or by imprisonment for not more than six months.~~

G. Washington

1. Authority to Levy Fines

Washington's Water Pollution Control Law (Chapter 90.48 RCW) authorizes the Washington Department of Ecology (WDOE) to enforce the State and federal water pollution control laws, with the assistance of the State attorney general. WDOE can issue notices of violations and administrative orders and can assess civil penalties for violation of Chapter 90.48 RCW or regulations or orders issued under its authority. This same authority will be utilized to require compliance schedules under the general permit and to levy fines under Washington's proposed NPDES general permit program.

2. Procedures for Identifying and Correcting Violations

The process of identifying violations under the proposed general permit program will be largely complaint-driven. The method for undertaking formal and informal enforcement actions will follow WDOE's standard enforcement procedures. Formal enforcement actions are undertaken if voluntary compliance cannot be achieved, or if the violation was significant. Formal enforcement responses may include a notice of violation (NOV), administrative order, civil penalty, resource damage assessment, and referral for court action. Other innovative approaches, such as mediation, environmental audits, mandatory education, consent orders or decrees, and compensatory actions may be applied when appropriate. WDOE favors informal

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enforcement in cases of insignificant or infrequent violations. Informal enforcement actions are intended to bring voluntary compliance within a certain period. Formal and informal enforcement actions involving dairy farms have increased significantly since Regional dairy waste inspector positions were created in 1989.

Under the current Agricultural Compliance Memorandum of Agreement (MOA) program, violations are identified by site investigations following complaints. If a violation of the State Water Pollution Control Act occurs, dairy operators are given an opportunity to return to compliance. Once the violation is confirmed by WDOE, the operator is referred to the local conservation district to develop a comprehensive conservation plan. The operator is given six months to develop the plan and 18 additional months to implement it to correct the problem. If the situation is critical, or if cooperation ceases, WDOE investigates the circumstances and initiates appropriate formal enforcement actions.

3. Penalties

Violation of any provision of the Water Pollution Control Law (RCW 90.48) or any provision of a regulation or administrative order issued pursuant to RCW 90.48 can result in civil penalties of up to \$10,000 a day (90.48.144 RCW). The minimum civil penalty that can be assessed is \$250, and additional assessments (RCW 90.48.142) can be made for quantifiable damages to public resources (e.g., fish kills). In 1992, 14 dairy farms were subject to formal enforcement action. Eighteen individual actions were taken including issuance of seven Notices of Violation, four Administrative Orders, and seven penalties totaling \$20,000.

If a violation relates to discharges from agricultural activities on agricultural land, WDOE must consider whether the enforcement action will contribute to the conversion of the land to non-agricultural uses. The Water Pollution Control Law (RCW 90.480.450) provides that the conversion of agricultural land to non-agricultural uses must be minimized.

H. Wisconsin

1. Authority to Levy Fines

Chapter 147.21 of the Wisconsin Pollution Discharge Elimination Law authorizes the Wisconsin Department of Natural Resources (WDNR) to initiate civil actions for a violation of the Law, any rule promulgated under the Law, or any term or condition of a WPDES permit issued under the Law. A person who knowingly makes a false representation in an application or report required by a WPDES permit, or who tampers with a monitoring device can face a fine and a prison term of up to six months. WDNR also can assess a penalty to cover the costs of investigating a violation which results in a civil penalty.

2. Procedures for Identifying and Correcting Violations

The process of identifying and correcting violations in Wisconsin is somewhat cumbersome. First, a complaint is registered with the WDNR. The complaint may be filed by anyone except the livestock permitting officials, including other WDNR staff. The complaint is then investigated by a field investigator from the district office, by a local USDA staff member (Soil Conservation Service, County Extension), or by the county sanitarium. If a high potential for discharge exists, a letter of warning is issued and the operation is monitored. If a discharge can be documented, the WDNR will issue a notice of discharge (NOD), which allows the operator from 60 days to two years to correct the problem. If the NOD expires and no effort has been made to resolve the problem, the WDNR will issue a short-term (usually six-month) WPDES permit that contains a strict compliance schedule with a timetable. If the operator has not met the compliance schedule at the expiration of the WPDES permit, the WDNR can turn the matter over to the Department of Justice. Several cases are pending, but because of the length of time needed to complete the process, no fines have been collected for permit violations. (The WDNR keeps an extensive record of all complaints, including the eventual resolution of the complaint.)

3. Penalties

Fines for violating the conditions of a WPDES permit range up to \$10,000 a day. If the violation is willful or negligent, the maximum penalty is \$25,000 a day and can include up to six months imprisonment. After the first conviction, the maximum fine for a willful or negligent violation is \$50,000 a day and/or one year imprisonment. The fine for making a false statement in an application for a WPDES permit, or in any report required by a permit, ranges from \$10 to \$10,000. The same fine applies to a person who tampers with a monitoring device required by a WPDES permit.

The animal waste control regulations also make provisions for assessing fines for discharging without a permit. A fine may be levied immediately if the discharge was deliberate, if the operation had been issued a NOD and another flagrant violation occurs, or if there is a fish kill. In the case of a fish kill, the livestock operator can also be required to pay clean-up costs. WDNR staff estimate that fewer than five operations a year are fined.

IV. PROGRAM COSTS AND BENEFITS

Estimating livestock waste management program costs and benefits is difficult because of a lack of data. In general, the permitting agencies surveyed indicated that programs are largely underfunded, but they could not provide information about the resources necessary to improve administration of the permitting programs. Furthermore, there is little data regarding improvements in water quality resulting from livestock waste management programs. Consequently, much of this chapter's discussion of costs and benefits is qualitative in nature. Topics covered include: estimated FTEs required, cost-share funding issues, farmer-incurred costs, general versus individual permits, and interagency coordination.

A. Arkansas

1. Estimated FTEs Required

Officials of the Arkansas Department of Pollution Control and Ecology (ADPCE) found it difficult to estimate how many FTEs they would need to run the livestock waste control permitting program most effectively. Arkansas has only 2.5 FTEs to review plans, write permits, and enforce permit conditions.

Staff report that they spend a significant portion of their time in public hearings and receiving complaints about odors from livestock operations (although they have no authority to deny permits on the basis of odor alone).

2. Cost-Share Funding Issues

The USDA's Agricultural Conservation Program 1991 Fiscal Year Statistical Summary shows that \$422,705 was awarded to 109 Arkansas farms for agricultural waste control facilities, an average cost-share of \$3,878 per operation. Arkansas permitting staff report that, to their knowledge, only small dairy operations use USDA's Agricultural Conservation Program (ACP) waste management cost-share funding. Apparently, dairy operators historically have had strong participation in the ACP's cost-share funding. This was also the case in several other surveyed States. ASCS, Soil Conservation Service (SCS), and State permitting staff believe that dairy industry efforts to increase farmers' awareness of ACP funding has been a primary reason for this strong participation.

USDA has a national policy entitled "Involuntary Performance of ACP Practices Policy", that was issued on February 1, 1991. This policy prohibits agricultural operators from receiving ACP funds when the installation of a practice (i.e., wastewater control facility) is required on an involuntary basis. An example of an involuntary practice is when a regulatory agency notifies the producer in writing that a specific action, such as a fine, will be taken. Thus,

livestock operators are not eligible for ACP funds if a specific written enforcement order has been issued. This applies equally to all States.

3. Farmer Incurred Costs

Under the draft general permit, Arkansas farmers can expect to incur various expenses associated with recordkeeping and reporting, developing their pollution prevention plans, monitoring and reporting, and permit fees. While some of these expenses are likely to be relatively significant, quantitative estimates are not available.

The draft general permit requires that the following records be maintained at the facility and made available upon request: calculations required for land application rates and retention capacity, date log indicating monthly inspection of retention facility, date log indicating weekly inspections of wastewater level in retention facility (freeboard), and date log of waste removal from the facility including date of removal, name of hauler, and the dry tons removed.

Additional reporting provisions in the ~~draft general permit~~ require that waste and/or wastewater applied to the land must be analyzed for pH, ammonium nitrogen, potassium, total nitrogen, phosphorus, and percent solids at least once a year. Samples of the soil to receive waste and/or wastewater must also be analyzed annually for pH, phosphorus, potassium, and nitrates. Results of the waste and soil analyses, the locations of land applications, volumes and nitrogen applications rates for the previous year, methods of land application, and types of crops grown on each application site also must be submitted to the ADPCE yearly.

Farmers also will incur costs to develop pollution prevention plans. Under the draft general permit, a facility operator must develop and implement a pollution prevention plan within one year after the effective date of the permit. The following specific requirements must be addressed in the plan:

- **Pollutant Source Identification.** A site or topographic map outlining the drainage area of the CAFO, each existing pollution control structure, all surface waters, a list of significant spills or leaks of toxic pollutants, and all existing discharge data must be supplied;
- **Wastewater Management Controls.** Documentation supporting the management controls used to contain wastewaters and storm waters, logs of quarterly structural control inspections, construction criteria for all retention facility embankments, compaction test certification by a registered professional engineer, a dewatering schedule, and a log of all measurable rain events must be provided;
- **Liner Requirement.** Documentation that no hydrologic connection exists between ground water and contained wastes must be provided or a liner must be installed. Documentation must be certified by a professional engineer or qualified ground water professional;

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- **Preventive Maintenance.** A schedule to ensure compliance with conditions of the general permit is required. Involves inspection and maintenance of all management devices, as well as inspecting and testing equipment and systems;
- **Sediment and Erosion Prevention.** The plan must identify areas that have a high potential for significant soil erosion and must identify measures to limit erosion; and
- **Employee Training.** Training dates must be identified in the plan. In addition to the training requirements contained in ADPCE Regulation No. 5, employees will be instructed on the components and goals of the pollution prevention plan.

Finally, under Arkansas's draft NPDES general permit for CAFOs, operators will be responsible for the annual permit fee of \$200 which must be remitted to the ADPCE along with of the Notice of Intent (NOI) to be covered by the general permit.

4. General Versus Individual Permits

Although Arkansas has not implemented the NPDES program for confined animal facilities, the State has received authority to administer the NPDES program, including the issuance of general permits to all categories of dischargers. ADPCE staff believe that one of the greatest advantages of a general permit is the time that will be saved issuing a general permit instead of individual permits. The current State permitting program requires individual permits to be issued to confined animal facilities with liquid waste management systems—a time-intensive process. (See Chapter II, "Arkansas' Inspection Requirements" for the steps involved in the individual facility permitting process.) Under the NPDES program, the Department may issue a single general permit to a category of point sources located within a geographic area where discharges warrant similar pollution control measures.

5. Interagency Coordination

Interagency coordination is crucial to ensure that the technical requirements of a liquid waste management system permit are met. With many permit applications, the ADPCE works closely with the SCS and the Arkansas Soil and Water Conservation District (AS&WCD) to fulfill the requirements of the permitting process.

The ADPCE requires that designs and waste management plans meet SCS technical specifications. Permit components that must conform to SCS specifications include the timing of the land application of wastes, liner requirements, and measures to minimize off-site offensive odors. Livestock facility operators must have all construction plans, specifications, and design calculations signed and approved by a State registered professional engineer or an SCS engineer. Management plans also must be signed and approved by the SCS, a State registered professional engineer, or an AS&WCD water quality technician.

B. Indiana

1. Estimated FTEs Required

Indiana Department of Environmental Management (IDEM) staff say they would need an additional six to seven FTEs to operate the State approval program effectively. The program would be structured with three to four environmental scientists to perform first-stage plan review and on-site inspections, and to pursue enforcement actions. One environmental manager would manage the environmental scientists and do the final plan review and permit issuance, while a senior environmental manager would manage the entire program and would be responsible for maintaining the extensive publicity campaign.

2. Cost-Share Funding Issues

Cost sharing funds are available from the Agricultural Stabilization and Conservation Service's (ASCS) Agricultural Conservation Program. In 1991, 33 participants received a total of \$130,456 for the construction or improvement of agricultural waste control facilities. Technical assistance to design wastewater control facilities is available from the SCS. In addition, grants are available to producers through Purdue University to study specific wastewater control alternatives. IDEM staff report that SCS and ASCS assistance is most effective for existing facilities that need to upgrade wastewater control facilities. IDEM staff believe that the cost of coming into compliance is the major barrier for operators of existing facilities that have not yet obtained State approval.

3. Farmer Incurred Costs

No permit fees are associated with the Indiana confined feeding operation approval program. The State program has no recordkeeping, monitoring, or reporting requirements, so operators will not incur any direct costs in participating in the confined feeding operation approval program. The State program applies mainly to new facilities, so the only cost a farmer would incur would be the cost of building a facility that does not discharge instead of building one that does. IDEM staff report that intensifying industry competition is requiring operators to manage waste efficiently, so non-regulatory factors are causing facilities to be constructed and operated in a manner consistent with livestock waste regulations.

4. General Versus Individual Permits

Although Indiana has general permit authority, IDEM would issue individual NPDES permits to any confined feeding operation that meets the definition of a CAFO. Because the State's

approval program requires inspections and approvals for new facilities, IDEM staff believe there would be little advantage to covering the operations with a general permit.

5. Interagency Coordination

The program now relies on county sanitariums or SCS staff to respond to complaints, even though they are not trained to inspect livestock feeding facilities. Complaints usually are received by the county board of health or the county sanitarium and are referred to the IDEM central office. IDEM staff refer the complaint to the county sanitarium, the local conservation officer, or to the IDEM emergency spill group, if documentation is appropriate.

C. Iowa

1. Estimated FTEs Required

The primary limitation of the State livestock permitting program is a lack of staffing. However, Iowa Department of Natural Resources (IDNR) staff were not willing to estimate the number of additional FTEs necessary to operate the current program at a reasonable level, because they believe it is unreasonable to expect an increase in resources for staffing.

2. Cost-Share Funding Issues

Cost-sharing funds are available to build wastewater control facilities through the Agricultural Stabilization and Conservation Service's (ASCS'S) Agricultural Conservation Program (ACP). The program will cover 50 percent of the cost of approved materials and operations, subject to the approval of the county ASCS board. In 1991, 19 participants received \$82,148 under both annual and long-term programs for the construction of animal waste control facilities.

Cost-share funds are also available from the State Water Protection Fund, administered by the Soil Conservation Division of the Iowa Department of Agriculture and Land Stewardship. The Division uses its portion of the lottery-funded Resource Enhancement And Protection (REAP) money for projects to improve the State's water quality. The REAP program began in FY 1990 as a 10-year program, with initial funding of \$20 million which was expected to increase to \$30 million. Instead, the level of funding has decreased to \$10.6 million in FY 1993, and will decrease further to \$7 million in FY 1994. The Soil Conservation Division's 20 percent share of REAP money is distributed through the 100 local soil and water conservation districts, which received about \$5,000 each in FY 1993. The money is used for a variety of programs at the discretion of the local board, but because of the low level of funding and the high cost of animal waste control facilities, relatively little is available for livestock operators.

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Last year, only 5 to 7 projects received any funds. Funds are available to pay for 50 percent of the cost of projects to correct animal waste (solid, liquid, and runoff) problems at existing facilities. No funds are available to purchase equipment, or to expand existing operations.

IDNR officials believe that more operations could participate in programs if the funds were restricted to the lowest-cost projects and practices. Any costs above the most basic design would be borne by the operator. Staff maintain that cost-share funds should be available only for the most cost-effective designs and practices. Because new livestock feeding operations generally incorporate adequate wastewater control measures in the overall design, cost-share funds are most effective if used only to upgrade existing facilities.

3. Farmer-Incurred Costs

No permit or application fees are associated with the State construction, operating or NPDES permits. Costs directly associated with the livestock permitting program are for record-keeping, monitoring and reporting, and the expense of building or renovating a livestock operation to conform to permit conditions. However, the entire cost of achieving compliance at an operation cannot be attributed to the permitting program. IDNR staff maintain that the industry trend towards larger, more efficient operations is causing livestock waste management practices to become more advanced. Facilities are gradually coming into compliance with the State livestock waste regulations as a matter of survival, and not as part of an attempt to conform to permit conditions.

4. General Versus Individual Permits

Iowa has no general permit for animal feeding operations. Because Iowa's animal feeding regulation includes enforceable minimum waste control requirements for all confined livestock operations, IDNR staff see no value in covering a number of operations (non-discharging by definition) with a general permit.

5. Interagency Coordination

The IDNR has provided Section 319 funds to enable the SCS to upgrade its policies and procedures for assisting operators in developing wastewater control facilities and to train field engineers and technicians working on animal waste control facilities. Currently, the SCS is only minimally involved in designing livestock wastewater control facilities, and its expertise in livestock waste control system design has decreased. The aim of the training program is to increase the proficiency of SCS technicians so that they can more efficiently develop plans for animal waste control. IDNR staff believe this upgrade in training can be very effective in controlling animal waste discharges.

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The IDNR is also working with other agencies and producer groups on a variety of projects designed to inform and educate livestock producers on proper animal waste management practices. Section 319 funds have been provided to ISU Extension to establish a statewide network of farms on which different waste management systems for open feedlots can be observed, and Section 319 funds are also being used to support a county-wide livestock management program in Carroll County. In addition, various State and federal agencies and livestock producer groups are cooperating with IDNR to distribute a booklet explaining Iowa's animal waste control regulations, and many of these same groups will participate in a series of six regional waste management meetings for pork producers later in 1993.

IDNR staff believe greater success can be achieved by coordinating their efforts with other programs and producer groups to increase the environmental responsibility of animal feeding operations rather than by making the permitting requirements more stringent. IDNR staff are focusing on providing environmental protection with fewer resources, because they believe that there will be no increase in resources for the program in the future.

D. Kansas

1. Estimated FTEs Required

Kansas Department of Health and Environment (KDHE) officials report several weaknesses in the Kansas permitting program, however, the primary weakness is the lack of sufficient staff in the animal waste unit and in the legal (enforcement) system. Because of the lack of adequate permitting staff, there is a four- to five-month backlog of new permit applications awaiting processing. Staff also indicated that rapidly changing livestock inventories, in addition to changes in feedlot sizes in response to differing economic conditions and personal situations, make it difficult to keep up-to-date on facility statistics in Kansas.

Officials in the agricultural waste unit would like to have three more FTEs, for a total of 12, to run the animal waste control program properly. Kansas staff prefer to work on an active, rather than on a reactive, basis (i.e., they want to educate feedlot operators on how to install proper waste control systems before construction, instead of policing their insufficient waste control systems after construction). With additional staff, officials believe the program could be more active and could focus on education and program upgrades. The permitting staff believes that education should be an important part of the permitting system.

2. Cost-Share Funding Issues

A total of \$9,327 in cost-share funding was awarded to seven participants for wastewater control systems in 1991. Despite this relatively low funding level, ASCS representatives believe that more than half of all Kansas livestock producers participate in the ACP program at one time or another. Besides additional funding, State permitting officials feel that making

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grass filters eligible for cost-share grants, especially for small operations, would make the ACP cost-share program more effective.

Additional cost-share funding is available from the State Conservation Commission, which administers two programs: the State Water Resources Cost Share Program and a non-point source pollution control fund.

3. Farmer-Incurred Costs

The KDHE bases livestock waste control permitting fees on the size and type of the livestock operation. Annual permit fees for confined animal feeding operations in Kansas are:

- Cattle, hogs, and sheep
 - - < 1,000 head, no fee
 - - 1,000 to 4,999 head, \$30
 - - 5,000 to 9,999 head, \$75
 - - 10,000 head and over, \$150
- Dairy
 - - < 500 cows, no fee
 - - 500 cows and over, \$30
- Poultry
 - - < 10,000 fowl, no fee
 - - 10,000 to 49,999, \$30
 - - 50,000 to 99,999, \$75
 - - 100,000 fowl and over, \$150

Besides the annual permit fees, the livestock facility operator is responsible for all expenses associated with the permitting process's 30-day public notice period.

4. General Versus Individual Permits

Kansas permitting officials believe that implementing a general permit program would be difficult because of the State's emphasis on site-specific plan review and control measures. Furthermore, they do not believe that a general permit would save time since permit issuance is the last step in the permitting process and is a minor part of the States' overall waste management program.

However, the State's current method of permitting individual livestock facilities is not without faults. Officials told interviewers that an individual State permit requires a minimum of 27 hours of staff time to process. Ordinary delays can increase the processing time to three months (not including 30-day public comment period) once the waste management plans

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have been prepared. This estimate assumes that there are no complications in the permitting process, so it is possible that the process could take even longer for some applicants.

5. Interagency Coordination

Besides the KDHE, at least two other State agencies regulate livestock operations in Kansas. The Animal Health Department provides operating licenses to feedlots with over 1,000 AUs, and the State Board of Agriculture, Division of Water Resources, issues water appropriation permits for facilities with over 1,000 head and construction permits for impoundments with capacities greater than 30 acre-feet.

In 1991, the SCS provided some degree of technical assistance for 200 animal waste control plans. Of these 200, approximately 125 were developed into final plans that year. Final plans include construction drawings and specifications, operation and maintenance plans, and waste utilization plans. The SCS engineering staff develops the majority of the plans submitted to KDHE for approval. Both KDHE and SCS field personnel attempt to coordinate site visits, and technical issues are frequently discussed by the two agencies at the State level. The department does not require that plans be developed by the SCS, but KDHE does encourage producers to obtain technical assistance from the SCS, the Cooperative Extension Service, or qualified engineers and consultants.

E. Nebraska

1. Estimated FTEs Required

Nebraska permitting staff do not know how many FTEs would be necessary to run the State's livestock waste permitting program most effectively. The director of the Nebraska Department of Environmental Quality (NDEQ) recently combined the industrial waste permitting program with the agricultural waste permitting program and reduced the number of FTEs devoted to the agricultural program from 4.5 to 2.5. At a minimum, agricultural staff would like to have 2 additional FTEs to inspect waste control systems.

2. Cost-Share Funding Issues

In 1991, 17 participants received an average of \$2,300 each in cost-share funds (\$39,100 total) to help with the construction of animal wastewater control systems. Funds to build or operate livestock wastewater control facilities may also be available from the States' 23 Natural Resource Districts (NRDs). Decisions to provide cost-sharing funds for livestock waste control facilities are made case-by-case at the NRD level and must be justified by water quality concerns.

State permitting officials report that a large portion of the livestock feeding operations in Nebraska cover more than 10 acres or have complex designs, making them ineligible for SCS technical assistance. They believe that a federally funded program is needed to help operators of large CAFOs develop sufficient livestock waste control systems.

3. Farmer Incurred Costs

The NDEQ does not charge an initial application fee, and it does not charge annual, modification, or ownership transfer fees for NPDES permits. There is also no fee associated with the State-issued livestock waste control system construction permit.

4. General Versus Individual Permits

As discussed in Chapter I, the NDEQ has NPDES general permit authority, but has not implemented this program for agricultural waste control. Because livestock operations with waste control systems must be inspected and must obtain State construction permits, Department officials do not believe that there are significant benefits to a general permit. In Nebraska, individual NPDES permits for animal waste control systems are a relatively minor part of the State's total permitting program.

5. Interagency Coordination

The Nebraska livestock waste control construction permit requires coordination between the NDEQ and at least two other State agencies. The waste control facility must be designed by the SCS (or other qualified persons) in compliance with minimum design requirements set forth in Title 130 "Rules and Regulations Pertaining to Livestock Waste Control." Information gathered in the pre-construction, on-site inspection by NDEQ staff is shared with SCS engineers for use in the design process. The agencies generally cooperate at other points throughout the construction permitting process.

The Nebraska Department of Agriculture's Bureau of Dairies and Foods is also involved in the permitting process. Title 130 requires dairy operators to have the location of their proposed waste facility reviewed by the Bureau. Bureau approval must be noted on the construction application form that is submitted to the NDEQ.

F. Region VI

1. Estimated FTEs Required

Estimates of the number of FTEs that would be necessary to administer the program are not available, although Region VI personnel believe that one to two FTEs may be committed to the program. The adequacy of this potential commitment of staff is unclear. It depends in part on the number of potential violations (and associated inspection and enforcement requirements) that will be incurred by the estimated 1,000 facilities that may be covered by the general permits.

2. Farmer Incurred Costs

CAFO operators will incur a variety of reporting, recordkeeping, training, and monitoring costs associated with the provisions of the ~~general permits~~. The cost of developing a pollution prevention plan will include expenses for various recordkeeping requirements such as developing a description of potential pollution sources, preparing and updating a site topographical map, and describing the waste management controls implemented at a facility. Facility operators must also develop and update documentation regarding all calculations used to support the design, construction, and sizing of waste control facilities. Operators must have, in lieu of liners to ensure that there are no discharges to ground water, a study completed by a qualified ground-water scientist indicating that there is no hydrological connection between the waste storage facilities and surface water. Operators also will incur costs to develop plans for waste handling and land application of CAFO wastes, a preventive maintenance plan and plans for spill prevention and response procedures.

Besides the required documents associated with the pollution prevention plans, on-going operating costs will be incurred, including employee training. Periodic site inspections also must be conducted by designated facility personnel, who must complete reports for every inspection. For any discharges, operators are required to maintain rainfall records and have discharge constituents analyzed. Such discharges must be tested for fecal coliform bacteria, biological oxygen demand, total suspended solids, pH, and pesticides which the operator has reason to believe could be in the discharge. Finally, operators must keep records indicating that the land application of wastes is made in accordance with permit provisions.

3. General Versus Individual Permits

Region VI anticipates that costs to farmers will not differ significantly between general and individual permits because the requirements are essentially the same for both types.

However, the Agency is expected to incur lower costs with the general permits. Developing individual permits is very resource intensive, and use of a general permit is expected to

reduce overall administrative burdens. Significant cost savings are expected in permit development and review, adhering to public notice requirements, and permit issuance.

4. Interagency Coordination

Developing the general permits has required substantial interagency coordination. USDA personnel have assisted with defining siting requirements and reasonable technical and operation requirements. Facility operators will likely require on-going assistance from USDA personnel in developing pollution prevention plans to meet SCS standards for their waste management facilities.

The Agency also coordinated with the U.S. Fish and Wildlife Service in developing the general permits. As a result, requirements to mitigate potential harm to endangered species and migratory birds are included. The Agency also will report to the Fish and Wildlife Service any fish kills resulting from facility discharges.

G. Washington

1. Estimated FTEs Required

The major problem facing the dairy waste control program is a lack of staffing. Washington Department of Ecology (WDOE) officials estimate that the regional staff could be doubled from the current 4.5 FTEs to 9 FTEs. This would allow WDOE to more effectively operate the present Agricultural Compliance Memorandum of Agreement (MOA) program and handle the additional workload associated with the proposed general permit program.

2. Cost-Share Funding Issues

Cost-sharing funds are available to Washington dairy farmers from several sources. WDOE administers the Centennial Clean Water Fund (CCWF), which provides at least \$4.5 million annually for all types of nonpoint source projects, including dairy waste. The funds pay for technical assistance and education. In addition, 50 to 75 percent cost-share grants may be awarded from the CCWF for agricultural best management practices (BMPs), including waste storage lagoons. Applications for cost-share funds to implement agricultural BMPs are based on a water quality management plan that is approved by WDOE. The plan must include a characterization of the watershed that describes the beneficial water uses, water quality trends, biological assessments, etc.

WDOE also administers the State Revolving Fund (SRF) loan program which provides approximately \$4.5 million annually for all categories of non-point source projects, including

dairy waste management. These funds are available for government agencies to provide as loans for the implementation of agricultural BMPs, including waste storage lagoons.

Both the CCWF and SRF are awarded on a competitive basis (i.e., dairy wastewater quality projects must compete with other projects for funds). Since 1989, a total of \$2.6 million CCWF and SRF funds have been awarded for dairy waste management projects. Of this total, approximately 1 million in SRF funds have been awarded to implement dairy waste BMPs.

Three million in State Referendum 39 monies was recently made available to the Washington Conservation Commission for disbursement to local Conservation Districts to augment existing dairy waste management programs. The distribution and exact use of these funds has not yet been determined.

3. Farmer Incurred Costs

Under the proposed general permit program, Washington dairy farmers will incur several types of costs including permit fees, monitoring and reporting costs, and the costs of achieving compliance. By State law (RCW 90.48.465), the fees collected for permits must cover the costs of administering the permitting program. The current annual fees for dairies, established by WAC Chapter 173-221A, range from \$100 to \$1,000 per year, based on the size of the dairy. The fees proposed under the NPDES general permit would be reduced by 30 percent to reflect the lower cost of administering a general permit program. Based on 1991 dairy farm herd size data, WDOE estimated the annual permit revenues would total \$198,940. The table below shows the sources of those revenues.

Dairy Herd Size	Number of Farms	Fee	Annual Revenue
0 - 199	922	\$70	\$64,540
200 - 399	304	\$175	\$53,200
400 - 599	82	\$350	\$28,700
600 - 799	56	\$525	\$29,400
above 800	33	\$700	\$23,100
Totals	1,397	—	\$198,940

This estimate assumes that all Washington dairy farms will be covered by the general permit, but at this point it seems likely that most dairies will not be covered by the general permit. If that becomes true, WDOE staff believe that the proposed permit fees will have to be increased to cover the cost of the general permit program.

Washington has reduced the monitoring and reporting requirements of the proposed general permit in response to industry concerns. The permit will be revised prior to additional public review. Under the original draft, the operator was required to record the application rate of wastewater and solids, an estimate of the crop nitrogen needs, the soil nitrogen content, and the names of those who accept animal waste from the dairy. The annual recordkeeping

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requirements are limited to facility identification information and summaries of system upsets, failures, and discharges. Written reports must be submitted to WDOE within five days of a discharge and must describe the volume and duration of the discharge, the receiving water body, and any steps taken to correct the problem that caused the discharge.

A preliminary draft Small Business Economic Impact Statement (SBEIS) estimated the potential economic impact to dairy farms of various herd sizes in both eastern and western Washington. The cost estimates ranged from about \$5/cow/year for a farm currently in compliance to about \$100/cow/year for an operation totally out of compliance. The WDOE is revising the estimates of compliance costs with assistance from the Dairy Federation, the SCS, and the permit Advisory Committee.

4. General Versus Individual Permits

WDOE officials initially estimated that the cost of administering a general permit program will be about 30 percent lower than the cost of administering a program using only individual NPDES permits. The initial estimate assumed that most dairies would be covered by the general permit. However, because changes in the proposed program will reduce the number of dairies covered by the general permit, the WDOE expects that the cost to operators will be higher. Administering the general permit program will still be cheaper than administering an individual permit program, but the cost will be borne by fewer operators.

5. Interagency Coordination

Depending on the final configuration of the general permit program, WDOE may continue to coordinate with the Washington Conservation Commission on compliance and enforcement actions. Under the current MOA program, dairy operators causing water quality violations are referred to local conservation districts to develop comprehensive conservation plans. The operators initially are given two years to voluntarily implement the conservation plans in order to achieve compliance. If cooperation ceases at any point, WDOE initiates formal enforcement, if appropriate, to achieve compliance. This arrangement with the Conservation Commission would continue under the Washington State Dairy Federation proposal for implementing the general permit program. On the other hand, WDOE's proposed implementation plan would eliminate the collaboration with the Conservation Commission. WDOE officials regard the policy of referring operators to the Conservation Commission as a buffer to full compliance.

H. Wisconsin

1. Estimated FTEs Required

Wisconsin Department of Natural Resources (WDNR) officials cite a lack of sufficient staff for permitting and for compliance monitoring and enforcement as a major problem. Specifically, three to five additional FTEs would allow the permitting program to be adequately applied to large operations in the State. Additional permitting staff would allow follow-up visits to new sites and the elimination of the application backlog. The addition of enforcement and compliance (field) staff would allow an annual, scheduled inspection program and would allow livestock permitting staff to be more involved in complaint investigation.

2. Cost-Share Funding Issues

Several cost-sharing programs target manure management. Through the USDA's Agricultural Conservation Program (ACP), the ASCS administers funding, and the SCS provides waste management technical support to operators. The ASCS will fund up to 50 percent of the costs of implementing certain manure management measures, with an annual cap of \$3,500 per operator. In 1991, ASCS awarded \$270,034 in cost-share funding to 105 participants for wastewater control under the annual program and \$1,601,603 to 151 participants under long-term agreements.

For operators receiving a notice of discharge (NOD), funds are available from the Wisconsin Farmers' Fund, administered by the Wisconsin Department of Agriculture, Trade and Consumer Protection. Funds are available to cover up to 70 percent of the cost of capital improvements, with an upper limit of \$20,000 for waste storage facilities. There is no upper limit on the funds available for feedlot runoff control projects. Because a significant number of discharges are caused by poor management practices, the program also coordinates with county land conservation programs to provide technical assistance for improved management practices. A small but significant number of operators elect not to participate in this program after receiving an NOD. State permitting authorities interpret their non-participation as unwillingness to come into compliance and respond by stepping up their enforcement actions.

Cost-share funds are also available through the Nonpoint Source Water Pollution Abatement Program. Operators in a watershed may be eligible for cost-share funds to offset certain capital improvements if a water quality inventory reveals impaired water quality. All of the farms in an affected watershed are placed in one of three categories to determine eligibility for funds. A certain number of Category I farms (those determined to have a critical impact on water quality) must volunteer to participate in the program in order for the watershed to be eligible for funds. If the required number of Category I operations participate, funds are also available to operations designated Category II. Operations designated Category III are not eligible for cost-share funds through this program. In general, funds are available to offset up to 70 percent of capital improvement costs, with a cap of \$20,000 for animal waste control facilities. In the 1992-93 fiscal year, \$11.5 million was budgeted for the program, with about 50 percent directed towards livestock waste control. Participation in the program is strictly

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voluntary, and participation rates have risen to 70 percent in recent years. In return for cost-share funds, the operator must follow strict management practices. The program is very comprehensive; the management practices can include requirements for crop rotation, contour farming, or the implementation of buffer strips to retard runoff.

WDNR staff report that the biggest problem with the cost-share programs is that participation in the most effective program (the Nonpoint Source Water Pollution Abatement program) is strictly voluntary. An operator with the highest potential to cause water quality violations in a watershed may opt not to participate, even though all of the neighboring operations have signed up. In addition, to avoid the appearance of punishing operators who decide not to participate, the WDNR does not investigate potential dischargers discovered during visits associated with the watershed program.

3. Farmer-Incurred Costs

No permit fees or application fees are associated with the WPDES permitting program. Operators incur expenses associated with recordkeeping, monitoring and reporting, and the cost of building or renovating facilities to comply with permit provisions.

4. General Versus Individual Permits

Wisconsin has NPDES general permit authority, but it does not have a general permit for CAFOs. Because of the small number of large (>1,000 AU) operations in the State, WDNR staff do not see any advantage to a general permit.

5. Interagency Coordination

WDNR uses the equivalent of one FTE from USDA or other local staff in advisory roles for complaint investigation in three of its district offices. The use of other agencies' staff means that the network of field staff is very strong; someone familiar with livestock operations is located within 45 minutes of any site in the State. In addition, other WDNR staff (e.g., fish and game wardens) are on call at all hours to respond to emergencies.

V. CONCLUSIONS

A. Summary Of Surveyed Programs And Cost/Benefit Information

1. Facilities Covered

State programs use two criteria to determine whether a facility is a concentrated animal feeding operation (CAFO) and must be covered by a National Pollutant Discharge and Elimination System (NPDES) permit: the facility size and its potential to discharge. Kansas and Wisconsin use facility size (1,000 AUs or more as outlined in 40 CFR 122 Appendix B) as the sole criterion for determining whether a NPDES permit is required. The six other surveyed programs regard the effect of the 25 year, 24-hour storm event exemption of Appendix B as lessening or negating the importance of the size requirements. For example, Indiana requires NPDES permits for livestock operations that both meet the size requirements and discharge into waters of the State. Nebraska ignores the size distinctions and determines case-by-case whether CAFOs must have permits based upon their discharge potential.

2. Non-NPDES Programs

Whether a facility must have a State permit usually has nothing to do with whether or not it must have a NPDES permit. Five of the eight surveyed States have State livestock permitting programs and NPDES programs. Coverage under the State permitting programs depends on such criteria as facility size, potential for discharge, type of facility, and method of waste control. The State livestock permitting programs, which often expand and supplant the NPDES requirements, tend to receive more agency attention and resources than do the NPDES programs.

3. Ground Water Authority

The federal NPDES regulations for CAFOs do not include authority to regulate discharges to ground water. The States discussed in this report, however, have been given express authority by their legislatures to regulate discharges to ground water. In practice, however, the surveyed programs emphasize preventing discharges to surface water.

4. Manure Application Guidelines

All of the surveyed programs interpret in the same way their authority to regulate conditions for manure application under a NPDES program; they view it as limited to specifying that

manure must be applied at agronomic rates, under soil and weather conditions that will not cause runoff. The Iowa and Indiana programs have additional State authority to include manure application guidelines as permit conditions. However, most regulatory agencies do not include specific waste application recommendations in permits.

5. Enforcement and Compliance

All of the surveyed programs lack sufficient resources for enforcement and compliance. Consequently, waste control programs are forced to rely on voluntary cooperation, nuisance complaints, and a few significant, well-publicized penalties to maintain compliance. However, programs do not always view the of lack enforcement resources as a shortcoming. Also, Kansas program staff suggest that operators should be encouraged to spend money on correcting the causes of the violations.

6. Program Costs

Permitting agencies and the facility operators incur costs associated with effective livestock waste control programs. These costs are difficult to quantify because of a lack of data.

Costs incurred by the regulating agencies include the number of full-time equivalents (FTEs) needed to run their programs effectively. While some State agencies could estimate the optimal number of FTEs they require, others could not. However, all regulatory agencies report that their waste control programs are understaffed. Even Kansas, with the largest waste control staff of the surveyed programs (9 FTEs), reports that a personnel shortage contributes to the state's four- to five-month backlog of new permit applications.

Operators incur costs for permit fees, operation and maintenance, recordkeeping and monitoring, employee training, and building or renovating facilities to comply with their NPDES permits. Usually, the burden of permit fees, recordkeeping and monitoring costs, and employee training costs is relatively light. Operators' major expense is the cost of bringing facilities into compliance with permit conditions. In some cases, cost-share funding to aid with capital improvements may be available from the U.S. Department of Agriculture's (USDA's) Agricultural Conservation Program and from non-point source water pollution abatement programs. The cost of compliance seems to be the major obstacle keeping operators from voluntarily seeking permits. However, officials in most surveyed states indicated that producers are constructing and operating their facilities in ways that lead to de facto compliance with permit conditions as a matter of good business practices.

7. Program Benefits

Directly measuring the benefits of a livestock permitting program is also difficult because data are unavailable. Program staff identify water quality improvements as one measure of a program's benefits. Officials in Arkansas, Nebraska, and Iowa noted improvements in general water quality, although it is not possible to determine how much improvement resulted from livestock permitting programs. In Wisconsin, improved water quality was documented for a number of livestock facility sites. The number of fish kills attributable to animal feeding operations has decreased in Iowa, Kansas, and Nebraska, as has the number of water quality violations caused by confined feeding operations in Indiana.

B. Necessary Components of a Comprehensive NPDES Feedlot Waste Management Program

1. Identification

Identifying unpermitted CAFOs is the first step in any comprehensive NPDES feedlot waste management program. Because of resource shortages, most of the surveyed programs rely on voluntary or complaint-driven methods to identify unpermitted CAFOs. Several programs report success in identifying unpermitted CAFOs through voluntary measures that rely on educational efforts by the private sector. In Iowa and Nebraska, for example, producer groups have educated operators about permit requirements and have encouraged compliance. In Arkansas, large-scale poultry and swine contractors often require their facility operators to obtain permit coverage as a condition of their contracts.

2. Permitting Process

Components of a permitting process may include:

- Site inspections to assess and describe the facility's environmental impact, or document that it causes no significant impact, and to establish appropriate pollution control practices;
- Permit applications or notices of intent (NOIs) to obtain permit coverage, along with appropriate provisions for public comments;
- Waste system design and plan review to verify that the facility will conform to the applicable regulatory specifications.

3. Permit Components

The necessary permit components in a comprehensive feedlot waste management program include coverage, prohibitions, waste disposal requirements, pollution prevention plans, monitoring and reporting requirements, signatory requirements, and standard conditions.

- *Coverage* including the permit area, eligibility, limitations, and authorization;
- *Prohibitions, requirements, and other conditions* including discharge prohibitions, settling basin and holding pond requirements, and prohibitions on unauthorized substances;
- *Waste disposal requirements* such as the need for waste and site management plans, land application requirements, and waste disposal recordkeeping and reporting requirements;
- *Pollution prevention plans* specifying the minimum measures needed to reduce or eliminate the potential for pollutants to be discharged from the facility;
- *Monitoring and reporting requirements* such as provisions for discharge notification, land application reports, sampling, retention of records, and availability of reports; and
- *Standard conditions* including the duty to comply, penalties for permit violations, proper operation and maintenance, need to halt or reduce activity not a defense, property rights, inspection and entry, a reopener clause, and permit fees.

4. Enforcement

Permit conditions can be enforced in a number of ways, including provisions for voluntary compliance, a complaint-driven approach, or a rigorous CAFO inspection schedule with strict civil penalties for violators. A strong enforcement component is important to maintain the credibility of a permitting program.

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APPENDIX A

CONCENTRATED ANIMAL FEEDING OPERATION

WASTE CONTROL SURVEY

1. Identification

- Name: _____
- Title: _____
- Agency: _____
- Phone: _____

General Program Overview

2. Which State departments/agencies have regulatory jurisdiction over environmental aspects of concentrated animal feeding operations (CAFOs) in your State? (Discuss program history.)

3. Are any CAFOs exempted by State policy from being covered under a NPDES permit?

4. Does your State have specific, additional regulatory authority for CAFOs beyond the control requirements under the federal CWA regulations? If yes, describe. (Please include descriptions of any ground water-related authorities.)

5. What resources are dedicated to program implementation (i.e., annual budget, FTEs) for your permitting program? For other programs? Are these resources sufficient to carry out the federal or State regulatory requirements? If not, how would you propose to allocate new resources?

10. Number of Operations in State:

	Facilities with over 1,000 animal units		
	Number of operations	Permitted	In Process
Beef			
Dairy			
Swine			
Poultry: Layers			
Broilers			
Other			

	Facilities with less than 1,000 but more than 300 animal units		
	Number of operations	Permitted	In Process
Beef			
Dairy			
Swine			
Poultry: Layers			
Broilers			
Other			

Permitting and Enforcement

11. How many operations with greater than 1,000 AUs are covered by permits in your State? How many with 300-999 AUs? With less than 300 AUs? How old are the permits? How many permits have expired and been extended?

12. Does your State have general permit authority? Is there any type of tracking system that allows you to know the number of operations covered by a general permit? How many operations do you cover in a general permit in your State?

13. Are the feedlot permits issued in your State usually individual permits, general permits, or both? Why?

14. On what criteria are permits based? Are permits primarily based on facility size, potential for discharges, or other criteria?

15. Assuming that greater emphasis is placed on permitting facilities perceived to pose greater ecological risks, what criteria are used to determine high risk facilities (e.g., surrounding population, water resources, potential for groundwater discharge to surface water, soils and topography)?

16. How are case-by-case CAFO designations made in your State? Which of the factors defined in 40 CFR § 122.23 are most significant (size and location of operation, amount of waste, means of conveyance, slope, vegetation, rainfall, etc.)?

17. How do State permitting authorities make best professional judgment (BPJ) determinations for operations with less than 1,000 AUs?

General

34. What would you change about your program if you could?

35. What would you change about the EPA program if you could?

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APPENDIX B

SAMPLE NOTICE OF INTENT (NOI)

APPENDIX B

***NOTICE OF INTENT (NOI) to be Covered by the General Permit for
Concentrated Animal Feeding Operations***

This notification shall not be made to EPA, Region 6 if prohibited from coverage under Part I.C. of this permit.

Name and Address of Facility (include County or Parish): _____

Telephone Number: _____

Name of Operator: _____

Name, Address and Telephone of Owner (if different) _____

Numbers and Type(s) of animals confined at the facility (e.g., feeder pigs, dairy cows, etc.): _____

Actual acreage occupied by the facility: _____

Latitude and Longitude Location of the Facility:

LATITUDE _____ degrees _____ minutes _____ seconds

LONGITUDE _____ degrees _____ minutes _____ seconds

Receiving stream (if known): _____

State Permit Number (if applicable): _____

Signature:

Signature must be in accordance with
Part IV.I of the General Permit

Date Signed

APPENDIX C

GLOSSARY

25 Year, 24-Hour Storm Event - The maximum 24-hour precipitation event with a probable recurrence interval of once in 25 years, as defined by the National Weather Service.

Aerobic - The presence of free oxygen, or the use of bacteria and free oxygen to reduce organic matter.

Agronomic rates - The land application of animal wastes at rates of application which provide the crop or forage growth with needed nutrients for optimum health and growth.

Anaerobic - The absence of oxygen, or the use of anaerobic bacteria to reduce organic matter.

Animal feeding operation - A lot or facility (other than an aquatic animal production facility) where animals have been, are, or will be stabled or confined and fed or maintained for a total of 45 days or more in any 12-month period, and the animal confinement areas do not sustain crops, vegetation, forage growth, or post-harvest residues in the normal growing season.

Animal unit - A unit of measurement for any animal feeding operation calculated by adding the following numbers: the number of slaughter and feeder cattle and dairy heifers multiplied by 1.0, plus the number of mature dairy cattle multiplied by 1.4, plus the number of swine weighing over 55 pounds multiplied by 0.4, plus the number of sheep multiplied by 0.1, plus the number of horses multiplied by 2.0.

Best management practices (BMPs) - Schedules of activities, prohibitions, maintenance procedures, and other management practices found to be the most effective and practicable methods to prevent or reduce the pollution of waters of the United States. Best management practices also include treatment requirements, operating procedures, and practices to control site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Clean Water Act - Federal Water Pollution Control Act as amended, also known as the Clean Water Act, found at 33 USC 1251 *et seq.*

Concentrated animal feeding operation - An animal feeding operation which meets the criteria in 40 CFR Part 122, Appendix B, or which the Director designates as a significant contributor of pollution pursuant to 40 CFR 122.23. Animal feeding operations defined as concentrated in 40 CFR 122, Appendix B are as follows:

1. New and existing operations which stable or confine and feed or maintain for a total of 45 days or more in any 12-month period more than the numbers of animals specified in any of the following categories:
 - a. 1,000 slaughter or feeder cattle;
 - b. 700 mature dairy cattle (whether milkers or dry cows);
 - c. 2,500 swine weighing over 55 pounds;
 - d. 500 horses;

Feedlots Case Studies of Selected States

- e. 10,000 sheep or lambs;
 - f. 55,000 turkeys;
 - g. 100,000 laying hens or broilers when the facility has unlimited continuous flow watering systems;
 - h. 30,000 laying hens or broilers when facility has liquid manure handling system;
 - i. 5,000 ducks;
 - j. 1,000 animal units from a combination of slaughter steers and heifers, mature dairy cattle, swine over 55 pounds and sheep.
2. New and existing operations which discharge pollutants into waters of the United States either through a man-made ditch, flushing system, or other similar man-made device, or directly into waters of the United States, and which stable or confine and feed or maintain for a total of 45 days or more in any 12-month period more than the numbers of animals in the following categories:
- a. 300 slaughter of feeder cattle;
 - b. 200 mature dairy cattle (whether milkers or dry cows);
 - c. 750 swine weighing over 55 pounds;
 - d. 150 horses;
 - e. 3,000 sheep or lambs;
 - f. 16,000 turkeys;
 - g. 30,000 laying hens or broilers when the facility has unlimited continuous flow watering systems;
 - h. 9,000 laying hens or broilers when facility has liquid manure handling system;
 - i. 1,500 ducks; or
 - j. 300 animal units (from a combination of slaughter steers and heifers, mature dairy cattle, swine over 55 pounds and sheep).

Provided, however, that no animal feeding operation is a concentrated animal feeding operation as defined above if such animal feeding operation discharges only in the event of a 25 year, 24-hour storm event.

Confinement feeding - Feeding in limited quarters, often under a roof and over slotted floors.

Control facility - Any system used for retention of wastes on the premises until their ultimate disposal. This includes the retention of manure, liquid waste, and runoff from the feedlot area.

Earthen pit - A liquid manure storage structure constructed entirely (except for a concrete pad or ramp) of natural soil, hauled-in clay or soil and bentonite.

Holding pond - A detention device that stores runoff water from a settling basin.

Lagoon - A reservoir or pond built to contain water and animal wastes until they can be removed or decomposed either by aerobic or anaerobic action.

Feedlots Case Studies of Selected States

Land application - The removal of waste water and waste solids from a waste control facility and distribution to, or incorporation into the soil mantle primarily for disposal purposes.

Liner - A barrier in the form of a layer, membrane or blanket, installed to prevent hydrologic connection between liquids contained in retention structures and waters of the United States.

Liquid manure - A mixture of water and manure, usually less than 10 percent solids.

Livestock Waste - Generally refers to animal waste, but may also contain bedding, feed, and other by-products of an animal feeding operation.

Open confinement - A fenced area where the animals are fed, but that is not a pasture. Generally an open animal feeding operation will have a high density of animals, will have little or no vegetation, and will be covered with a manure pack such that periodic cleaning is necessary.

Open feedlot - (See open confinement, above).

Process wastewater - Any process generated wastewater directly or indirectly used in the animal feeding operation (such as spillage or overflow from animal or poultry watering systems; washing, cleaning, or flushing pens, barns, and manure pits; direct contact swimming, washing, or spray cooling of animals; and dust control) and any precipitation which comes into contact with any manure or litter, bedding, or any other raw material or intermediate or final material or product used in or resulting from the production of animals or poultry or direct products (e.g., milk, eggs).

Process generated wastewater - Water used either directly or indirectly by an animal feeding operation for various uses, including: spillage or overflow from animal poultry watering systems; washing, cleaning, flushing pens, barns, manure pits, or other feedlot facilities; direct contact swimming, washing, or spray cooling of animals, and dust control.

Retention facility or Retention structures - All collection ditches and conduits for the collection of runoff and wastewater, and all basins, ponds, and lagoons used to store wastes, wastewaters, and manures.

Settling basin (or channels) - Type of temporary runoff storage area where the liquids flow at a very slow velocity, which allows the solids to settle out and the liquids to drain out slowly.

Waste retention pond (or retention lagoon) - Excavated or diked structures or natural depressions provided for or used for the purpose of holding animal wastes and other associated animal feeding operation materials.

Waters of the United States

1. All waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce.
2. All interstate waters, including interstate wetlands.
3. All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa

lakes, or natural ponds the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce including any such waters:

- a. Which are or could be used by interstate or foreign travelers for recreational or other purposes;
- b. From which fish or shellfish are or could be taken and sold in interstate or foreign commerce;

or

- c. Which are or could be used for industrial purposes by industries in interstate commerce.
4. All impoundments of waters otherwise defined as waters of the United States under this definition.
 5. Tributaries of waters identified in paragraphs (a) through (d) of this definition.
 6. The territorial sea; and
 7. Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs 1. through 6. of this definition.

Wetlands - Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

**THE REPORT OF THE VERIFICATION OF
COMPLIANCE SUBGROUP**

August 1993

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**THE REPORT OF THE
VERIFICATION OF COMPLIANCE SUBGROUP**

I. PURPOSE

The purpose of this report is to analyze methods of verifying compliance of livestock feeding facilities with their NPDES permits and to recommend an approach(es) for utilizing these methods.

II. PROBLEM STATEMENT

Discharges from many smaller feedlots (less than 1,000 animal unit [AU] capacity) with identifiable pollution problems are usually not regulated by enforceable National Pollutant Discharge Elimination System (NPDES) permits. Most holders of permits for larger feedlots that have typical "no discharge" permits are required to report self-monitoring compliance data only when a discharge occurs, although some States require annual reporting. In most ~~EPA Regions~~ and many States, feedlots with typical "no discharge" waste controls have not been reissued a permit after their first permit expired during the 1970s. Almost all of the issued feedlot NPDES permits are classified as "minor" pollution sources or are covered by a general permit; thus, under the present inspection strategy, they are not given priority for inspection targeting.

EPA does not routinely review all compliance data related to minor permits. Also, the permits normally do not include limitations or monitoring requirements that address impacts on ground water. Only a few of the States with a large agriculture base have regulatory staff assigned to address agricultural waste problems. For example, Kansas has nine full-time employees (FTEs) involved with feedlot compliance monitoring while EPA, in the entire NPDES program, devotes less than one FTE.

In reality, many facilities in the universe of feedlots may not constitute a significant source of pollution. The present Nonpoint Source Coordinator for EPA's Chesapeake Bay Program, who formerly worked as EPA's agricultural waste expert at the Ada, Oklahoma, laboratory, has estimated (by impression, not by data collection) that 80 percent of all facilities east of the Mississippi River and 60 percent west of the River are capable of discharging pollutants to surface waters. This impression supports the development of a targeting strategy to effectively manage limited compliance monitoring resources.

III. BACKGROUND

A. Regulatory Requirements

The 1972 Amendments to the Federal Water Pollution Control Act (Clean Water Act) prohibit the discharge of pollutants from a point source into waters of the United States

except in compliance with conditions of an NPDES permit. Section 502 of the Act defined a point source to include a "concentrated animal feeding operation" (CAFO). In 1973, NPDES regulations at 40 CFR 122.23 and Appendix B were promulgated defining CAFOs subject to permit as a point source as feedlots that (1) feed or maintain more than 1,000 animal units (AUs) or the equivalent, depending on category, or (2) are designated on a case-by-case basis as significant contributors of pollution (later regulations were promulgated which required permits for facilities having 301 to 1,000 AUs which discharge through a man-made conveyance or directly to waters on the facility).

In 1974, the effluent limitations guidelines for the feedlot point source category were promulgated at 40 CFR 412, which established best practicable control technology (BPCT) as no discharge from a feedlot except in the event of a 10-year 24-hour rainfall. The guidelines defined best available technology economically achievable (BAT) as no discharge except for a 25-year 24-hour rainfall. As the result of the regulations and categorical feedlot standards, all CAFOs over the 1,000 AU threshold were directed to make application for an NPDES permit.

B. Status of NPDES Control of CAFOs

A number of NPDES permits were initially issued by EPA to feedlots during the mid-1970s. For example, in EPA Regions 6, 7, and 8 where most commercial beef feeder facilities are located, site inspections were conducted by EPA and the States at many feedlots to develop the requirements in facility-specific NPDES permits. Most individual permits issued during this period were classified as "minor" permits when compared to other permits issued to municipalities and industrial sources.

With the NPDES permit authority delegated to many States (39 now approved) after 1974, the States found that issuing permits to the numerous feedlots was resource intensive and was not considered to be environmentally significant since the Federal regulations required no discharge except for a 25-year 24-hour rainfall after July 1, 1977. As the result, many feedlot permits were never reissued and compliance monitoring was suspended except in response to complaints. According to the National Permit Compliance System (PCS data base), only about 1,050 individual NPDES permits have been issued to CAFOs.

Since the 1980s, several EPA Regions (Regions 6, 8, 9, and 10) have issued general permits estimated to cover more than 1,000 feedlots in seven States (Arizona, Idaho, Louisiana, Oklahoma, New Mexico, South Dakota, and Texas); nevertheless, minimal compliance monitoring was undertaken except in response to complaints.

C. Fundamental Difference in Compliance Determination

Compliance monitoring for the feedlots is fundamentally different from most categories regulated by the NPDES program because permitted CAFOs use waste management rather than treatment facilities and thus are not required to record data and submit Discharge

Monitoring Reports (DMRs) except at times of discharge. Self-monitoring and reporting are routine requirements of most NPDES permits and provide the primary basis for determining compliance. Without self-monitoring data, there is little basis for targeting inspection or enforcement activities except for complaints or as part of special geographic/enforcement initiatives.

IV. RESOURCES FOR COMPLIANCE MONITORING

A. Limited Field Presence

Data in the Permit Compliance System (PCS) for the period from 1984 through 1991 showed that there were 1,250 inspections at feedlots, with none conducted by EPA. In the EPA Regions, no resources have been used for feedlot compliance monitoring and few resources for enforcement have been used (i.e., response to complaints) since the efforts of the mid-1970s. A severe limitation that has affected EPA's compliance inspection program is the continuing reduction of travel funding for inspectors. Limited resources and travel funds combined with the minor classification of feedlot permits have been cited by Regions that were contacted as the reasons for no feedlot inspections by EPA.

As part of the current Feedlot Workgroup efforts, a draft paper entitled "Feedlots Case Studies of Selected States" has been prepared. Study information is based on interviews with the regulatory staff in seven States (Arkansas, Indiana, Iowa, Kansas, Nebraska, Washington, and Wisconsin); the study noted the following:

"In most cases, the lack of personnel was identified as the primary impediment to effective implementation of State waste control programs....[creating an] inability to identify unpermitted facilities, backlogs of permit applications, inability to make scheduled facility inspections, and the inability to enforce permit conditions and pursue penalty collection."

According to the study, even in Wisconsin, which claims that all animal feeding operations over 1,000 AUs are permitted, officials cite the lack of sufficient staff for permitting and for compliance monitoring and enforcement as a major problem.

B. Scope of Feedlot Inspection

Based on discussions with compliance monitoring staff, the inspection of a feedlot does not normally involve the collection of wastewater samples, and since few waste control records are required to be maintained by the feedlot operator, the inspection also does not involve extensive records review like other NPDES inspections. The inspection focuses primarily on the waste control systems and the waste management and disposal practices and their impact on surface and ground waters in the area. The inspection is usually categorized as a

screening, reconnaissance, or complaint follow-up type and requires not more than several hours onsite. The total effort with travel and report completion amounts to 1 work day or less. Such inspections are typically performed in conjunction with other routine NPDES inspections or geographic initiatives to conserve travel and staff time.

C. Resource Projections

Using the 1987 Census of Agriculture (1) data on the number of agricultural operations confining more than 1,000 AUs in the Nation and applying an inspection resource factor of 1 work day per inspection, annual coverage would require the following resources.

Feedlots Over 1,000 Animal Units

Type of Facility	Number of Operations	Inspection Workyears
Beef feedlot	1,700	7.73
Dairies	780	3.55
Layer chickens	560	2.55
Broiler chickens	520	2.36
Swine	<u>2,400</u>	<u>10.90</u>
Totals	5,960	27.09

The following table summarizes the resource projections for inspections of all feedlots based on a 1-day annual inspection effort.

Feedlot Inspection Resources for 1-Day Annual Inspections

Feedlot Size	Number of Facilities	Inspection Work Years (cumulative)	
Over 1,000	6,000	27	
500 - 1,000	17,000	77	(104)
300 - 500	21,000	95	(199)
100 - 300	163,000	741	(940)
20 - 100	177,000	805	(1,745)
Under 20	<u>421,000</u>	<u>1,914</u>	(3,659)
Total	805,000	3,659	

The 27 WYs needed to annually inspect all larger feedlots (over 1,000 AUs) would be a significant portion (27 percent) of the resources now used by EPA and approximately 5 percent of resources used by EPA and States combined for all inspections by EPA at NPDES major permittee, pretreatment programs, and Class I sludge facilities.

Comparing data in the above table shows that inspection resource requirements increase dramatically as smaller and smaller feedlots are included in the inspection plan. Inspections down to a 500 AU feedlot size would quadruple the effort; inspections down to 300 AUs would increase the effort by almost an order of magnitude. Routinely inspecting feedlots under 300 AUs causes a mushrooming in the demand for resources.

D. Compliance Monitoring Approaches

The resource analysis has demonstrated that annual inspection of any category of feedlots is a significant task at a time when inspection resources are limited in EPA and the States. Our analysis also shows that a complaint-driven system has not been effective in focusing resources. Therefore, different approaches should be considered.

1. Animal Inventory Grouping

We have learned from the workgroup paper, Water Pollution from Feedlot Waste, that about 80 percent of the inventory of beef cattle is on the larger feedlots with over 1,000 AUs and that about 50 percent of the chicken inventory is at facilities with more than the 1,000 AU equivalent. A much smaller percent of swine (20 percent) and dairy animals (8 percent) is confined at the larger operations. Therefore, the large beef feedlots (1,700) should be surveyed to confirm their waste control/management systems (most are open lot operations) by literature search or correspondence survey. The chicken operations are almost all housed facilities, so the concern is disposal of manure and dead birds. The chicken operations should be inventoried for manure disposal practices in counties where there is a manure surplus.

The following list ranks the States by largest inventory of specific animal types according to the 1987 Agricultural Census.

Animal Types	Ranking of States in Order
Fed beef	TX, KS, NB, IA, CO, CA
Dairies	WS, CA, NY, MN, PA, TX, OH
Layer chickens	CA, IN, GA, PA, AR, OH, TX, NC
Broiler chickens	AR, GA, AL, NC, MS, MD, TX, DE
Turkeys	NC, MN, CA, AR, MI, VA, IN
Swine	IA, IL, IN, MN, NB, NC

To research this approach of targeting areas with large animal inventories and to gather the necessary data to identify and prioritize them will require an estimated 40 hours of effort or \$2,500.

2. Geographic Targeting

Grouping inspections based on some common factor, such as geographic areas, is a logical way to conserve resources and focus on specific areas of interest. The largest areas of interest would be States, and the smallest areas would be counties and watersheds. States would be ranked based on different feedlot interests. Waste control initiatives in these States could be expected to have a greater impact on the feedlot problem. The area of regulatory controls in the following list identifies States that are known to have active programs for regulating feedlot wastes according to a draft paper for the workgroup, "Feedlots Case Studies of Selected States." States where EPA general permits are in effect could be of higher priority for compliance monitoring than States that have no such permits in effect.

Areas of Interest	States (not ranked)
Regulatory controls	AR, IA, IN, KS, NB, WS
General permits	AZ, ID, OK, LA, NM, SD, TX
Watershed approaches	CO, FL, ID, ME, NM, NC, OK, OR, WS

Counties, watersheds, and ground water aquifers should also be considered as geographic subgroups for targeting inspections. For example, we know from the workgroup paper, "Water Pollution From Feedlot Waste: An Analysis of Its Magnitude and Geographic Distribution," that there are about 28 counties where phosphorus is applied at high rates (more than 80 pounds/acre) because of animal waste disposal. The same analysis can be run for nitrogen application to croplands by county using USDA data.

The EPA document entitled "Geographic Targeting: Selected State Examples" (2) lays out a generic approach to ranking and targeting watersheds and waterbodies for special management attention; the document then gives example targeting systems used in 14 States. All of these systems consider inputs such as ambient data, discharge data, human health risks, hydrography (including ground and drinking water), habitat, population, recreation, and special factors (soil, slope, rainfall, etc.). Examples from the 14 States in the report describe approaches to targeting waterbodies.

The advantages of geographic targeting are that it focuses on water quality improvement; it will focus on areas of greatest concern; and it supports an integrated approach where other problems can also be addressed. The disadvantages are that it may target areas where there are no enforceable feedlot controls; it may require a diversion of limited resources; and the State may not support it because of other priorities.

A geographic initiative would require at least one FTE and \$50,000 to initiate a geographic targeting system, conduct compliance reviews, complete 20 inspections, and complete 10 formal enforcement actions.

3. Risk-Based Analysis

To rank potential candidates for inspection, one should evaluate them against some set of criteria that will characterize their pollution risk. The NPDES regulations at 40 CFR 122.23(c) include factors for making case-by-case designation of CAFOs; those and other important factors are listed below:

- **CAFO Pollution Risk Factors**
 - Size of feedlot (100k, 10k, 1k, 500, 300, 100)
 - Amount of waste reaching receiving waters
 - Location of feedlot relative to receiving waters
 - Means of conveyance of animal wastes and process wastewaters into receiving waters
 - Likelihood or frequency of discharge
 - Slope (greater than 2 percent and undiverted runoff)
 - Vegetation (no buffer zones or greenbelts)
 - Rainfall (retention and diversion systems)
 - Other relevant factors (discharges through manmade ditch or flushing device).
- **Other Risk Factors Not in Regulations**
 - Record of complaints and evidence of environmental harm
 - Absence of waste handling, treatment, and management systems that only discharge in the event of a 25-year 24-hour rainfall
 - Wastewater retention facilities or holding pens located in the 100-year flood plain unless flood protection provided
 - Poorly managed or overloaded waste control system
 - Uncontrolled runoff from manure storage and disposal areas
 - Contamination of ground or drinking water
 - Problems with contamination from feed and dead animals.

The feedlots can be ranked by assigning weighted values to each of the above factors, then rating each feedlot against the factors to produce a risk-based score for each facility. Feedlots with higher scores would be targeted for early or more frequent inspection based on the risk analysis.

The advantages of a risk-based analysis are that (1) it is the same approach used for most of EPA's environmental assessments; (2) it uses the selection factors cited in the feedlot regulations; and (3) it ranks candidates based on their measured pollution potential. Disadvantages of the risk analysis are that (1) it requires significant data collection and

analysis; (2) it may be labor intensive; and (3) the analysis will have to be repeated as the risks at each facility are resolved.

It is difficult to estimate the resources for testing this approach. A pilot study performed to rank the risk at 100 feedlots or targeted in a small State would require an estimated 500 hours of effort or \$30,000.

E. Compliance Monitoring Tools

The previous discussion examined only the conventional targeting mechanisms for feedlot compliance monitoring using EPA and State resources. Other resources and mechanisms can be applied to minimize, in some instances, EPA/State expenditures on compliance monitoring.

1. Remote Sensing

The most widely used and least costly remote sensing method for characterizing environmental problems is aerial photography. Aerial photo coverage of the United States has been conducted by the Federal government on a 5-year or more frequent basis since 1938. Satellite black/white, color, and infrared photo imaging coverage has occurred since the 1960s. Suitable photographs with third order to first order geodetic control are available from multisource data banks. EPA has most used such remote sensing capability to characterize Superfund sites at a cost of \$5,000 to \$20,000 per survey. Other government agencies have used aerial photography for decades for mapping, natural and agricultural resource inventories, and other topographical analyses. EPA studies usually do not require a special fly-over, but a USDA crop survey for one county the size of Montgomery County, Maryland, costs about \$5,000 to \$10,000.

The Office of Research and Development (ORD) in EPA has two laboratories, one in Las Vegas and one in Vint Hill, Virginia, where contractors (Lockheed and Bionetics, respectively) are dedicated to photographic interpretation projects. In 1984, Lockheed conducted a photographic analysis of feedlots in an area of Idaho for EPA Region 10. As a pilot study to support feedlot compliance, monitoring funds are being requested to update the 1984 Idaho survey and to conduct a photographic survey of a particular feedlot problem. The cost of the effort (400 hours) will be about \$25,000.

The advantages of photographic remote sensing are (1) low cost if used discriminately, (2) readily available current and historic data for any site in the Nation, (3) demonstrated successful use in Superfund, and (4) no required fly-overs. Disadvantages include (1) the large number of feedlots, which make photographic surveys too expensive to be widely used (cost compares to inspection) and (2) photos that can depict conditions only at the time the photos were taken.

2. Interagency Agreements

EPA has entered into many interagency agreements (IAGs) to address multijurisdictional issues. Through an agreement with the Minerals Management Service (MMS), EPA now obtains information from MMS inspections about offshore oil and gas facilities in the Gulf of Mexico and the Pacific Ocean to determine compliance with NPDES permits. Similar support for feedlot compliance monitoring can be obtained from the Department of Agriculture's Soil Conservation Service (SCS) and Interior's Fish and Wildlife Service (FWS).

Both SCS and FWS have active field technical staffs that can provide EPA with information about feedlot facilities with pollution problems. The advantages of using IAGs are that (1) they extend a regulatory presence; (2) they reduce duplications of effort; (3) they educate the other important authorities about environmental requirements; and (4) in the case of SCS, they gain more regular contact with feedlot operators. The disadvantages of IAGs are (1) the other agencies want resources for implementation; (2) SCS is reluctant to change its relationship with feedlot operators from technical assistance to a regulatory posture; and (3) successful implementation requires significant guidance, training, and oversight.

Development of ~~IAGs with SCS and the FWS~~ will take at least 2 years and require about one FTE of effort.

3. Volunteer Monitoring

Volunteer monitoring is growing in use and public involvement. BayKeepers and RiverWatch groups are active in more than 20 States. The Office of Water in EPA has a volunteer monitoring coordinator and has sponsored annual workshops since 1990 to promote public interest and provide guidance on monitoring. A member of the feedlot workgroup has prepared an article on how to survey feedlot problems for publication in the *Volunteer Monitor* newsletter.

As part of the compliance monitoring strategy for feedlots, volunteer monitoring could be promoted and supported. Funds will be needed to prepare a brochure or video on the magnitude of the feedlot problem and how to monitor feedlot waste management. Monitoring and investigative guidance will be prepared for use in workshops to train the volunteers. It is estimated that \$50,000 and 0.25 FTEs would start the program to develop and pilot guidance, training, and other promotional tools.

Advantages of the volunteer monitoring are (1) it does not require special equipment or technical expertise, it taps into a vast monitoring resource; (2) the monitoring resource is available in most locations where feedlots exist; and (3) it helps heighten public awareness. Disadvantages are (1) the volunteer monitoring data may not be reliable or enforceable; (2) resources are required to develop guidance and training; and (3) coordination and implementation are highly variable.

V. SUMMARY OF RECOMMENDATIONS

A. Conduct Data Inventory

Conduct a detailed data inventory before exploring the options for implementing any elements of the feedlot compliance monitoring strategy. Give notice to the Regions/States that feedlot inspection data in PCS are grossly incomplete and that all new entries must include the inspector's organization and the date and type of inspection. All available data sources should be inventoried and accessed. A first priority should be to inventory the records of complaints about feedlot problems in the EPA Regions and States. The efficient systems that provide easy access to these data about complaints should be documented and spread into other jurisdictions that lack the capability to manage their complaints.

The EPA Office of Wetlands, Oceans, and Watersheds (OWOW) maintains the Waterbody System (WBS) as an automated data base of State water quality assessment data. WBS serves as an inventory of each State's navigable waters that have been assessed for water quality and is used as the basis for the 305(b) Report to Congress every 2-years. WBS is linked to the EPA Reach (stream segment) File and STORET (ambient parametric data), which include NPDES point source data from the PCS and Industrial Facilities Discharge (IFD) file. As a voluntary system, WBS is currently being used by about 40 States, territories, and commissions. There are variations in how States manage and report data. As the consistency between States improves, so will the usefulness for targeting impaired waterbodies. The water quality assessment data in the WBS should be inventoried to target water quality-limited areas with feedlot problems in the 40 States that are now using WBS. Areas that have geographic initiatives planned or underway should be identified.

Data from the U.S. Department of Agriculture (USDA) can be used to target the counties with nutrient surpluses due to the disposal of CAFO wastes. These areas should then be matched with or superimposed on the waterbody problem areas. The areas can be ranked by the inventory of animals and other risk factors, targeting only as many areas as resources allow.

As part of the data inventory, a directive should be sent to the Regions and States to improve the compliance data tracking for feedlot inspections. As mentioned earlier in this report, most (about 75 percent) of the inspection entries in PCS are missing data, such as who did the inspection and the inspection date.

B. Monitor Compliance with General Permits

The five EPA general NPDES permits for feedlots that are now in place covering the States of Arizona, Idaho, Louisiana, Oklahoma, New Mexico, South Dakota, and Texas should be targeted for compliance monitoring. Any significant feedlot complaints in these States should receive compliance review and enforcement action if the problem is not resolved in a timely manner. At sites with complaints, the waste control systems should be verified. Where the

general permit requires a Notice of Intent, that requirement should be verified as part of complaint follow-up. This effort will require one FTE.

An enforcement initiative on one of the general permits should be piloted in one State. Contract support of \$50,000 will be requested to provide compliance review for this initiative, to evaluate results, and to recommend improvements. Using the results of the pilot initiative, one or more feedlot enforcement actions should be planned in each of the seven States. A communication strategy should be prepared as part of the initiative to promote sound environmental management in the feedlot community.

The advantages of acting on the general permits are the following: (1) clear regulatory authority exists that covers States with significant feedlot inventories; (2) permit action sends a message to the regulated community; and (3) such action provides a clear target for limited EPA/State resources. The disadvantages are that (1) any feedlot initiative diverts limited resources from other critical areas; (2) the approach is not equitable in that it targets specific States for action; and (3) the States may not want to support general permit enforcement because of resource or political constraints.

C. Consider Annual Certification

Explore the use of annual certification by feedlot operators to document the adequacy of their waste handling, management, and disposal systems. This approach is being adopted to implement pollution prevention practices for controlling storm water through NPDES permits.

D. Develop an Inspection Strategy Based on Targeting

Use the targeting tools already described to identify watersheds or other geographic areas with measureable feedlot problems. As a change to EPA/State inspection planning, in FY-1994 the Regions are asked to plan and coordinate inspections with their States to address specific problems that may include feedlots.

E. Conduct Pilot Studies

- **Use Remote Sensing.** Update the Idaho photographic survey of feedlots, and target one or more individual feedlots for photo interpretation.
- **Promote Volunteer Monitoring.** Publish a newsletter article immediately to provide guidance for volunteer monitoring of feedlot compliance. Begin preparing training materials for workshops and public outreach. Promote the use of hotlines for reporting feedlot problems.

F. Develop Interagency Agreements

Negotiate an agreement with the Soil Conservation Service to gather compliance information. Explore developing similar agreements with other agencies such as the FWS.

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**THE REPORT OF THE EDUCATION/OUTREACH
SUBGROUP**

August 1993

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THE REPORT OF THE EDUCATION/OUTREACH SUBGROUP

I. INTRODUCTION

An increasing amount of information indicates that animal wastes are contributing to water quality impairment nationwide. As a result, a State/EPA Feedlot Workgroup is examining several alternatives to reduce the pollutant loadings associated with animal feeding operations that cause impairments. The Education/Outreach Subgroup of this Workgroup focused on different means of encouraging environmentally sound management of these facilities to help eliminate associated water quality problems. This paper summarizes the subgroup's efforts by discussing existing communication vehicles, presenting two overall approaches to improve environmental management, and recommending options for each approach. Before proceeding, however, an understanding of the underlying problem and the behavior of the livestock feeding industry is necessary.

A. The Underlying Problem

The subgroup determined that a major problem in regulatory compliance and sound environmental management is the lack of communication between the Agency and livestock feeders. Although effluent guidelines for feedlots (i.e., concentrated animal feeding operations (CAFOs) with more than 1,000 animal units) were promulgated in February 1974 and CAFOs were defined as a point source requiring an NPDES permit in 1972, the livestock feeding industry either has not been very aware or lacks a clear understanding of relevant regulatory requirements. Although agricultural industries are partially responsible for being unaware, EPA is also responsible because it has invested few resources in increasing awareness of environmental regulations that affect agribusiness. Regardless, this lack of awareness may contribute to practices that cause water quality problems.

In the efforts used by this subgroup to determine what communication problems exist in this area, it became apparent that the agricultural industry is only distinctly aware of EPA programs that address pesticide licensing and application. Other regulatory programs are either not known or vaguely understood. This subgroup determined that EPA's focus on changing permittee behavior to improve environmental management of feedlots should include disseminating accurate and current education/information to the regulated community and providing incentives for proper management, including, if possible, funding for the implementation of new environmentally sound technologies for point source and nonpoint source facilities.

B. Behavior Characteristics of Agricultural Industries

Agricultural industries are unique in their close association with one another. Most other industries are extremely competitive and do not maintain open lines of communications.

Because agricultural products are essentially sold as commodities, direct price competition between growers does not strictly exist. Many agricultural prices are set by trading activity in stock markets. Milk, for example, is primarily sold as a co-operative effort of all the dairy producers in an area, which gives producers incentives to work together to produce a good product and to get a good price.

In addition, the pork and poultry industries are dominated by contractor-grower relationships. The contractor provides the grower with juvenile animals, and the growers feed and tend the animals to maturity. The grower is paid a set price per animal by the contractor. The contractor provides technical assistance and testing for the grower. Growers do not compete with each other for price or numbers of animals.

These organizational and marketing structures have caused the agriculture community to be considerably more communicative than other industrial groups. Moreover, this industry has developed several lines of communication among suppliers, associations, contractors, and grower/producers. EPA could easily use these lines of communication to encourage all stakeholders in this industry to operate in a more effective environmental manner. Any education, information, incentive, or enforcement program could be enhanced by using existing lines of communication with feedlot operators. In addition, EPA can access several other organizations, summarized in the following section, to disseminate information.

II. COMMUNICATION VEHICLES

When implementing approaches to encourage better environmental management of feedlots, EPA can use existing communication vehicles, which are highlighted in the following paragraphs. Appendix A lists organizations within this network. All agencies, producer groups, member organizations, and industries contacted by the subgroup are willing to use their communication lines to disseminate information about educational/information and incentive programs. In addition, the subgroup plans to survey all associations, agencies, and contract industries to determine all of the potential communication avenues available (see Appendix B of this report).

A. Federal Agencies

EPA's section 319 Nonpoint Source (NPS) program supports development and distribution of information to farmers and producers through various State agencies. EPA also conducts workshops and provides speakers for information forums as requested. In addition, EPA has a NPS newsletter and an electronic bulletin board which can be used to disseminate information.

The USDA and the USDA Soil Conservation Service (SCS) provide technical assistance and waste management information to producers. They communicate personally with the producers, as well as through newsletters and seminars.

In addition, SCS, the technical field "arm" of the USDA, provides education through a wide variety of workshops/seminars for the agricultural community and provides one-on-one technical support, developing site-specific nutrient management plans, as well as offering design service for best management practices (BMPs).

SCS, using an engineering field manual that delineates specifications and standards, designs approved BMPs. In many States, SCS certifies that the installations and systems meet State standards set by State water quality agencies. Assistance from SCS is generally in great demand.

The Farmstead Assessment System (Farm-A-Syst) is a joint EPA/USDA effort piloted at the University of Wisconsin that allows farmers to assess the potential for contamination of their drinking water wells from farmstead sources such as feedlots. The Farm-A-Syst program provides the farmer with a series of worksheets and factsheets that enable the farmer to evaluate potential sources of farmstead-specific pollutants including animal waste. As of June 1992, 19 States were in the process of using or modifying the program for their needs and were providing diagnostic and education modules to farmers. Assessment results are used to develop voluntary site-specific action plans.

B. State Agencies

State environmental agencies regulate and enforce State requirements (and often the NPDES program). These agencies generally maintain mailing lists and occasionally hold regulatory forums for producer education. These agencies occasionally distribute mailings or newsletters.

State departments of agriculture usually help producer facilities meet their obligations under State regulatory requirements. These departments usually disseminate information through regular newsletters and mailings. In addition, they typically provide direct contact with the producer through agent visits and some seminars.

State health departments normally conduct health inspections of all facilities in their States and, therefore, have direct contact with the operators, as well as the most current mailing lists.

University agricultural extension services conduct extensive outreach in all forms: newsletters, technical journals, seminars and workshops, mailings, and visits by extension agents. For example, the Louisiana State University Agricultural Center provides weekly packets to all newspapers in the State and audiovideo tapes for TV stations from its State offices. From the Parish offices, they provide weekly newspaper articles, newsletters to Parish groups, and some TV and radio programs. The Department of Agriculture and Forestry at the university prepares and distributes a monthly newspaper called the *Pelican Press*.

C. Producer Groups

Numerous producer associations provide their membership with several educational and informational sources. They publish trade journals, send out regular newsletters, mail out other information as necessary, conduct seminars and workshops, and provide telephone information/hotlines (800 numbers). These organizations have expressed an interest in disseminating information that EPA provides.

For example, the Texas Cattle Feeders Association (TCFA) has a weekly newsletter, provides special mailings, conducts seminars, publishes *Cattle Feeders Annual*, prepares research reports, develops and distributes an environmental notebook (summary of regulations), conducts onsite assessments of facilities, communicates daily with members by telephone, gives the TCFA Environmental Award, and operates an M-Net satellite computer link system.

The National Cattlemen's Association (NCA) produces a newsletter, issued approximately weekly to its members, that focuses on relevant news/updates concerning national legislation and rulemaking that affect cattle producers. NCA also issues a trade magazine that occasionally features ~~articles on environmental~~ issues. In addition, NCA has an annual convention which includes "Cattlemen's College"—an educational seminar series that has covered environmental issues.

The National Pork Producer's Council (NPPC) has been very involved in educating pork producers regarding proper environmental controls. For example, in 1993 they published a handbook for producers called "Environmental Quality in Pork Production." In addition, they have conducted numerous educational workshops for producers in Missouri, Iowa, Tennessee, and Indiana, and additional workshops are planned in the future in Illinois, Wisconsin and South Dakota. EPA has been working cooperatively with NPPC. NPPC is also supporting a project at the University of Arkansas to summarize all Federal/State laws that apply to livestock nationwide.

In another effort, EPA entered into an industry/agency cooperative agreement in 1991 with Southeastern Poultry and Egg Association, the USDA's SCS, and the Tennessee Valley Authority to disseminate information regarding water quality concerns to the poultry industry. These groups have formed what has become known as the "Poultry Water Quality Consortium." The consortium has developed an educational display, conducted a water quality workshop in the summer of 1993, and is developing a comprehensive water quality handbook for the poultry industry.

D. Industries

State Farm Bureaus are shareholder-owned companies that help provide farmers with information and technical assistance. For example, the Texas Farm Bureau publishes a quarterly newspaper, *Texas Neighbor*, a twice monthly newspaper, the *Texas Agriculture*, and a weekly newsletter; produces a video newsletter; and has TV satellite capabilities, which they use for special focus shows.

In addition, numerous agricultural companies and conglomerates and fertilizer companies communicate with growers and distributors, providing information and technical assistance. Tyson Foods, for example, provides extensive technical information/assistance to their growers. They have seminars and newsletters and their technical representatives visit growers once a week. Seaboard Farms of Colorado, Inc., also informs its growers through newsletters and training programs.

III. APPROACHES FOR EFFECTING CHANGE AND ENCOURAGING EXCELLENCE

People tend to change their behavior when they learn a better way or they are rewarded for changing. Therefore, two overall approaches to encourage environmentally sound management of feedlot operations are: 1) education and information dissemination, and 2) incentives. The Agency could use information channels discussed previously, as well as vehicles presented in the following discussion, to provide producers with new or different ways to operate their feeding facilities in an environmentally sound manner. This information coupled with an incentive system could initiate change. Appendix A, given at the end of this report, compares the workloads and costs of the various options.

A. Education and Information

Providing information and education programs to this industry as a whole will be more cost efficient than similar endeavors with other industries because of the characteristic close associations and interdependencies. Operator peer pressure and pressure from politically astute associations or contractor interactions can be subtle tools for environmental change. Most associations and contractor operations are willing to provide EPA with a "vehicle" to inform operators about proper environmental practices. Currently, the beef, dairy, poultry, and pork industries are under considerable public pressure to decrease the use of pesticides and hormones in food products and the environmental impacts of agriculture. Therefore, most producer associations and produce contractors are anxious to improve the public image of their industry. Interactions with EPA (e.g., educational programs or producer information) are one way for these industries to improve their environmental image.

Moreover, in contractor-operator relationships, which exist predominately in the poultry and pork producing industries, the contractor has a strong position of power and influence with the grower—the contractor supplies income to the grower for the service of growing the animal. These contractors are large national companies, with a strong desire to promote a good environmental public image. Because the contractor's name is so closely linked to the practices of the grower facilities, all of the contractors contacted in the preparation of this report (e.g., Tyson Foods, Seabrook Farms of CO., OK Foods) were very willing to provide their growers with current information from EPA on environmental practices, regulations, award systems, etc. Because of the unique grower-contractor relationship, this option may be one of the most effective means for educating and informing operators in the pork and poultry industries.

Producer associations are also becoming sensitive to public perception and environmental responsibilities. Both the beef and dairy industries have been hard hit by newer "health" concerns about cholesterol and red meat consumption. Previously, these industries simply had no public image; now they are very active in public relations attempting to improve their image. Because the strongest members of these associations are often the largest facilities, the opinions of the association frequently represent a few of the most active members. These active members are frequently the most politically astute and willing to yield to public opinion. They understand the benefits of being publicly perceived as environmentally "correct." The association also has a vested interest in providing the most current information to its membership, and the members view this as a primary function of the association.

Although education and information cannot directly change the way all facilities operate, they have always affected the most progressive faction. When a few facilities adopt environmentally safer ways of operating, others will follow the example. These examples will exert positive peer pressure and help prevent false information from proliferating through the industry. One of the most important results of disseminating EPA information directly to the producers is dispelling environmental myths about practices that may be more harmful than helpful to the environment. In addition, by providing information to the regulated public, EPA could emphasize pollution prevention measures and philosophies and would have the opportunity to enhance the public's understanding of EPA.

The following discussion highlights numerous options that can be taken to implement the education and information approach.

1. Educational Packets

Educational packets of environmental, funding, and regulation information can be prepared or updated and provided to all associations and agencies once each year. EPA could consolidate information from the NPS, permitting, enforcement, and funding programs and make copies available to other agencies and producers. Information sheets, such as "How to Comply With an EPA Inspection" and "Wetlands Protection," could be developed for these packets. This option is beneficial because it is an opportunity to provide comprehensive information. However, the option could become complicated because different packets would be required for different types of operations.

2. Monthly Updates

In addition, EPA could give monthly updates on EPA regulations, programs, and funding to all associations and agencies. These organizations could include the updates as a regular feature of their newsletters or mailouts. The update could comprise basic environmental information: impacts of agricultural wastes on the environment, new BMPs that the Agency supports, latest award recipients (or award criteria), available funds and instructions on how to apply, addresses for obtaining educational information, and information on organizations conducting innovative management or treatment. The advantage of this option is that

information is being disseminated rapidly through established forums that reach numerous operators. In addition, EPA does not incur the mailing and printing costs. One disadvantage is that the reports will ultimately be prepared by external sources and may not be ideally representative of the information EPA provides.

3. Speakers and Workshops

Another option is to provide speaker(s) for functions and seminars that are sponsored by other agencies and associations. Each Region or HQ could have speakers trained in specific topics to provide talks to the agricultural community. EPA could also sponsor workshops to provide an educational forum or institute a program to put on workshops. This option allows the Agency to emphasize pollution prevention measures and philosophies and to improve communication with the agricultural community. In EPA-organized meetings, the Agency would have full control over the content, style, and format of the information being delivered. If the speakers or EPA-meetings are not polished and informative, however, EPA's reputation could suffer.

4. Courtesy Inspections

A system of "courtesy inspections" could also be established where inspections are conducted at facilities to identify any compliance violations strictly for the benefit of the operator and to inform the operator of proper procedure—not for enforcement purposes. This type of inspection has already proved beneficial for some State health departments. The advantages of this option are twofold: EPA develops a benevolent image and operators receive education specific to their operations. However, this option requires a large time investment, can only reach a limited number of facilities, and may confuse the public about EPA's regulatory role.

5. Computer Networks

To reach a larger audience, EPA could enter information, including information sent to newsletters, on agricultural electronic bulletin boards (computer networks). This information could be updated daily or weekly so large amounts of the most current information could be given. Use of electronic bulletin boards is advantageous because the bulletin boards are readily available, information is delivered rapidly at little cost, and EPA controls the information. However, procedures must be developed to clear the information, and, because not all operators have access, EPA must rely on users to disseminate the information accurately.

6. Case Study

Many of these options can be and have been implemented during the permitting process. In the process of developing regulations, technical standards, and permits, the Agency should use every available opportunity to provide the regulated public information on the regulatory process and decisionmaking. The public's misconception of the limits on EPA's flexibility, mandates, and authority causes considerable confusion. This lack of understanding and confusion often results in resentment. EPA already has ample opportunity to provide information through the regulatory process and should continue to use this avenue.

For example, Region VI recently issued a general permit for all concentrated animal feeding operations in the States of Louisiana, New Mexico, Oklahoma, and Texas. In the process of writing, proposing, and issuing the permit, the Region scheduled several meetings with representatives from the livestock feeding industry. In addition, along with the public hearing and comment period process, the Region provided workshops with each scheduled public hearing. Also, personnel from the Region were available to give talks at other workshops and seminars. This allowed the Region to help the public understand the regulatory process, as well as how EPA is required to protect the environment. The public got to see first hand how EPA uses information and data to make determinations about permit conditions. The results of this intensive outreach effort were obvious. The regulated public and producer groups expressed their appreciation to EPA for the opportunity to work on a permit in the formative stages. The producer groups also started immediately to provide compliance guidance for their members (i.e., putting together model pollution prevention plans, developing simple sampling guidance, giving instructions to their members on best management practices required by the permit). Because industrial groups were providing information on guidance, deadlines, and waste management, the industry, as a whole, appeared willing to comply. Originally, Region VI had estimated that approximately 1,000 facilities would come under the authority of the general permit. To date, Region VI has received 1,256 Notices of Intent. It is unusual to receive applications from 100 percent of the expected permittees; however, it is not surprising considering all the attention that the industry associations gave this program. Perhaps this attention will encourage permit compliance by facility operators. The intensive outreach, though costly in work hours and travel expenses, saved the Agency the expense of defending the permit in court. Because the industry so fully understood EPA rationale and authority for the requirements placed in the permit, no legal challenges were made to what was originally considered a very controversial permit.

B. Incentive Programs

Incentive programs can include awards, grants, loans, or other methods of recognition or financial incentives. While these financial types of programs may effect change more rapidly than just providing information alone, they are costly and labor intensive for the Agency. Several other options that could provide incentive for change should be explored, such as the use of public opinion and peer pressure. With the relatively noncompetitive nature of this industry, peer pressure can take a distinctly positive direction.

1. Awards

The Agency could encourage producer's associations to provide an award system for facilities that have an outstanding environmental record. Awards could be given, for example, to the most innovative or environmental dairy farm, pork farm, poultry producer, or beef producer. The Agency could also award organizations for being proactive and encouraging compliance among their memberships. Criteria to evaluate facilities would have to be developed. This option could prove to be a powerful incentive for change and could be a mechanism/tool for organizations to use to encourage their members toward environmentally sound practices. In addition, the system could increase compliance with little cost. However, awards would have to be given carefully to avoid recognizing a facility with problems.

2. Grants/Loans

Although expensive - the required funding would probably have to be appropriated by Congress - a grant/loan program could be one of the best tools to change environmental attitudes in the agricultural industry. EPA could provide grants/loans for facilities to update or build better waste management technology, which would have the most direct and measurable effect on the environment. For example, the replacement of outdated management systems could greatly improve water quality in some watersheds. Several programs are already making significant progress, as noted in the following paragraphs.

a. USDA

USDA has encouraged proper management of manure resources by providing livestock producers with educational programs, technical assistance, and funding for construction of BMPs. Practice WP4, Agricultural Waste Control Facilities, is a BMP cost-share funded under the Agricultural Stabilization and Conservation Service's (ASCS's) Agricultural Conservation Program (ACP). The purpose of this practice is to reduce pollution by agricultural animal wastes where these wastes constitute a significant hazard. The structures provided under this practice include facilities for storing, handling, and treating agricultural wastes and controlling surface runoff. Table 1 indicates annual funding levels for construction of animal waste control facilities through the ACP program. No data are available to determine the total portion of SCS funding which is directed to animal waste management programs (SCS field agents generally work in several project areas, including animal waste management system design, as needed).

**Table 1. USDA Agricultural Conservation Program Cost Share for
Animal Waste Control Facilities**

Program Year	Units Assisted			Funding Level (\$M)	Percent of total ACP Distributions
	Counties	Farms	Structures		
1985	618	1,636	1,830	3.939	2.6
1986	566	1,416	1,661	3.335	3.0
1987	457	1,239	1,314	3.125	2.9
1988	604	1,677	1,947	5.415	3.4
1989	504	1,421	1,753	5.722	4.2
1990	613	1,873	2,348	9.448	7.1
1991	722	2,269	2,912	11.922	9.0

* Constant 1982 dollars

* From USDA, 1992. Agricultural Conservation Program, Statistical Summary: Fiscal Years 1985-1991. Agricultural Stabilization and Conservation Service, Washington, DC.

In 1988, USDA changed its cost-share policy to allow for 10-year, long-term agreements of up to a total of \$35,000 instead of the previous limitation of \$3,500 per year per person. With this change, a substantial portion of the costs of a waste containment facility could be cost-shared in the construction year; the farmer would not have to carry a large loan. This was an important step as banks are more likely to provide loans for farm machinery that can be sold by the bank if there is a default on the loan; animal waste containment structures generally cannot be liquidated and remain part of the property they are installed on.

The Water Quality Incentives Projects (WQIP) program is another program administered by USDA's ASCS which provides cost sharing to farmers to help implement various non-structural practices. This program funds, for example, development of nutrient management plans which assure proper management of manure from feedlots. This program is funded at \$18.5 million in FY 94 and will be providing assistance to many watersheds in 1994; EPA participated in a review panel in August 1993 to select watershed projects for funding.

b. Section 319 Nonpoint Source (NPS) Program

Section 319(h) of the Clean Water Act provides assistance to States, Territories, and Indian Tribes (hereinafter referred to as States) to assist in implementing State NPS management programs. To date, approximately \$190 million dollars have been provided to States under section 319(h) or about \$50 million per year. Section 319 (h) provides assistance for a variety of NPS implementation activities including animal waste management. Eligible activities include: information and education programs; technical assistance for installation of NPS controls such as animal waste practices; cost sharing for implementation of NPS controls in demonstration projects; and support for development of regulatory programs such

as animal waste regulations. Table 2 indicates the type and amount of support available to feedlot operators under EPA programs.

Table 2. EPA Funding Sources for Feedlot Projects

Program	Type of Support	Funding Level (1992)
Comprehensive State Ground Water Protection Program	• Education (Farm-A-Syst)	*Approx. \$10 M/yr total program funding
Section 319 NPS grants	• Education • Demonstration BMPs	*Approx. \$50M/yr total program funding incl. min. State match of 40%
National Estuary Program	• Education/planning	*Approx. \$15M/yr total program funding incl. 25% cost share
Chesapeake Bay Program	• Education • BMPs	Approx. \$9 M/yr on BMPs alone. \$55 M on BMPs by end of 1992. incl. 50% State match
Clean Lakes Program	• BMPs	*Approx. \$7M/yr inc. 50% State match
Nitrogen Action Plan	• Education	No specific funding

*Total program funding (includes projects unrelated to feedlots).

c. Other CWA Programs

There are several other CWA programs that support implementation of animal waste controls. Namely, the Clean Lakes Program under section 314 of the CWA provides cost sharing for installation of animal waste controls as part of watershed control programs for specific lakes. In addition, the Chesapeake Bay Program under section 117 of the CWA provides substantial cost sharing funds for installation of animal waste controls in the Chesapeake Bay States of Maryland, Pennsylvania and Virginia.

d. State Revolving Fund Program

The State Revolving Fund (SRF) program was authorized by the U.S. Congress through Title VI of the CWA as amended in 1987. Through it, EPA provides capitalization grants to States to establish their SRF programs. States must provide a 20-percent match for the Federal capitalization grants. SRFs provide loans, refinance existing debt obligations, guarantee or purchase insurance for local debt obligations, guarantee SRF debt obligations, and provide loan guarantees for "sub-state revolving funds." Under section 603(c) of the CWA, SRF

funds can be used to provide financial assistance for section 212 publicly owned wastewater treatment works, implementation of an EPA-approved State Nonpoint Source Management Program established under section 319, and development and implementation of an estuary conservation and management plan under section 320. Congress has appropriated about \$7.8 billion for the SRF program from FY 1989 through FY 1993.

Within the parameters of certain Federal requirements, States have the flexibility to establish SRF programs to meet their particular water quality needs. Under the SRF program, States are required to prepare annual intended use plans (IUPs), which identify how SRF funds are to be used. Projects to be funded for construction of wastewater treatment works (section 212 projects) must first appear on a State's priority list developed under section 216 of the CWA prior to being listed on the IUP. The selection of section 212 projects from the State's priority list to receive SRF assistance need not be made in priority order. Activities to be funded under sections 319 or 320 must be consistent with the EPA-approved State Nonpoint Source Management Program or the Estuary Conservation and Management Plan, respectively.

i. Eligibility of Feedlots Under the SRF Program. The potential availability of low-cost funding from SRFs could provide an incentive to feedlot operators to comply with NPDES permit requirements. SRFs can provide assistance to persons (i.e., privately owned facilities) to address nonpoint source problems identified in NPS Management Programs. Unlike grant assistance provided under section 319, SRF assistance to persons is not limited to demonstration projects.

The status of SRF funding of concentrated animal feeding operations (CAFOs) is uncertain given that they are defined as point sources in the FWPCA and covered under the NPDES permit requirements. Section 212 privately owned facilities cannot currently receive SRF assistance. The Office of Wastewater Enforcement and Compliance (OWEC) has referred the issue of feedlot eligibility under the SRF program to the Office of General Counsel.

As part of the CWA reauthorization, Congress is considering options on eligibility of expanded uses of the SRF to address water quality needs. Senate Bill 1114 (drafted by the Senate Committee on Environment and Public Works) includes specific authorization for feedlots.

ii. State Use of SRF Funds for Nonpoint Sources. Five State SRF programs (California, Delaware, Maryland, Washington, and Wyoming) are addressing nonpoint source needs. Of these States, only Delaware is currently developing a mechanism to address discharges from feedlot operations. Delaware's program establishes a partnership involving State conservation districts, the Soil Conservation Service (SCS), the Agricultural Stabilization and Conservation Service (ASCS), the Delmarva Poultry Industry, eight poultry companies, and thousands of poultry producers to coordinate the available Federal and State funds for building chicken manure storage and dead bird composting structures.

e. Other State Funded Programs

About 40 States have non-federally funded State loan or grant programs to finance wastewater treatment and other infrastructure or environmental projects. Many states have general NPS cost sharing programs which share the cost with farmers for installing agricultural BMPs. A few example states include: Wisconsin, North Carolina, Minnesota, Virginia, Pennsylvania, Maryland, and Iowa. Utah also has a State-funded loan program.

3. Enforcement

Enforcement actions are always a strong incentive for environmental compliance for the regulated facilities. In addition, facilities that are not automatically considered point source facilities can be designated by the Director if there is sufficient cause. The Agency can use the potential for designation as an incentive to motivate change in smaller or other previously unregulated facilities. EPA could stress in its educational programs how facilities can ~~eliminate themselves as~~ a water quality problem and, therefore, reduce their potential to be regulated in the future. Moreover, EPA could publicize which types of facilities would be first priority in the development of new regulations. This would encourage those facilities to be more aware of their environmental problems and possibly address them to reduce their environmental "profile."

IV. RECOMMENDATIONS

The committee recommends the development of a communication strategy that incorporates several of the education/outreach strategies discussed in this paper. We recommend that the Agency concentrate on providing educational packets to the industry through the associations, agencies, and private organizations that want to participate. This approach will be the easiest and quickest strategy for EPA to pursue and will require the least amount of additional funding. Existing NPS programs can also be used to incorporate information about the regulatory processes.

In addition, the committee recommends that the Agency provide a speaker program. This is the most efficient way to provide one-on-one contact with the regulated public. Although more expensive than other options, the committee believes that a speaker program is important for changing the industry's attitude toward regulation and the Agency.

Lastly, the committee believes that EPA should encourage the industry and professional organizations to offer environmental awards and courtesy inspections. Information on these two ideas could be included with the educational packets sent out to these organizations. This approach provides an incentive program that does not depend on EPA's ability to generate funds; it also does not confuse the public as to EPA's role as regulator.

**Appendix A. Work Load and Cost Comparison of Activities Which EPA
Could Use To Encourage Agricultural Industries To Promote
Environmental Issues**

Activity	Work Load	Cost
Provide monthly update on EPA regulations/programs/funding to all associations and agencies which have mailouts/newsletters.	Organizing the information and putting together a monthly bulletin would probably require 0.3 FTEs	Mailing and paper costs would be minimal
Put EPA information on all agricultural electronic bulletin boards (computer networks).	Organizing the information and putting together a monthly bulletin would probably require 0.3 FTEs. The person would have to be computer literate.	The cost of computer time varies for different bulletin boards.
Provide educational packets of environmental, funding and regulation information to all associations and agencies once/year.	Gathering the information and organizing it in a user friendly way would probably require 0.2 FTEs	Again, mailing and resource costs would be minimal.
Provide speaker(s) to speak at requested functions and seminars that are sponsored by other agencies and associations.	If this was addressed at the HQ level it would take at least one full FTE to cover the entire U.S. If this was addressed Region by Region it would take 0.5 - 0.25 FTEs each.	The major expense would be an extensive travel budget and minimal costs for slides and handouts for speaker materials.
Develop EPA sponsored workshops to provide an educational forum.	This would only be practical if organized by HQ. It would take at least 2 FTEs to set up and organize the work shops.	This would require a lot of financial support. The cost of materials, mailings, travel, conference hall rental, etc.
Provide a "Courtesy Inspections" system where a non enforcement inspector visits facilities and points out compliance violations for the benefit of the operator.	This would need to be addressed on the Regional level and would require one FTE per Region.	Would require an extensive travel budget.

**Appendix A. Work Load And Cost Comparison Of Activities Which EPA
Could Use To Encourage Agricultural Industries To Promote
Environmental Issues (continued)**

Activity	Work Load	Cost
Provide an award system for facilities which have an outstanding environmental record.	0.1 FTEs per Region for evaluating facility petitions and 0.3 FTEs at HQ level to approve and make awards.	Minimal cost for certificates.
Provide grants/loans for facilities to update or build better waste management technology.	1 FTE per Region to award the grants/loans. 1 FTE in HQ to develop grant/loan policy.	LOTS OF MONEY!

Appendix B. Selected List of Organizations in the Communications Network

Federal/National Agencies

United States Department of Agriculture
Soil Conservation Service
South Agriculture Building
14th and Independence, SW
Washington, D.C. 20250

CTIC (Conservation Technology Information
Center)
1220 Potter Drive, Room 170
Purdue Research Park
West Lafayette, Indiana 47906-6952
(317) 494-9555

Sample State Contacts for USDA:

United States Department of Agriculture
Soil Conservation Service
South National Technical Center
P. O. Box 6567
Fort Worth, Texas 76115-6567
(817) 334-5242

United States Department of Agriculture
Soil Conservation Service
101 South Main Street—
Temple, Texas 76501-7682

State Agencies

Sample State Contacts:

Texas

Texas Water Commission
Ms. Marilyn Long
Texas Water Commission
Agricultural Section
17th and Congress, 1st Floor
Austin, Texas 78701

Texas Agricultural Extension Service
303 Agricultural Engineering Building
College Station, Texas 77843-2121

Texas State Soil and Water Conservation
Board
311 North 5th
P. O. Box 658
Temple, Texas 76503
(817) 773-2250

Texas General Land Office
Gary Mauro, Commissioner
Stephen F. Austin Building
1700 North Congress Avenue
Austin, Texas

Texas Department of Agriculture
P. O. Box 12847
Austin, Texas 78711
(512) 463-7476

Oklahoma

Oklahoma Department of Agriculture
Gary L. Sherrer, Commissioner
2800 North Lincoln Boulevard
Oklahoma City, Oklahoma 73150-4298
(405) 521-3864

Cooperative Extension Service
Division of Agriculture
Oklahoma State University
Department of Agricultural Engineering
214 Agricultural Hall
Stillwater, Oklahoma 74078-0469
(405) 744-5425 or 5427, Telephone,
(405) 744-9693, Fax

Oklahoma Conservation Commission
Hal Clark, Commissioner
2800 North Lincoln Boulevard
Room 160
Oklahoma City, Oklahoma 73105
(405) 521-2384

New Mexico

State of New Mexico Environment
Department
Mr. Jim Piatt, Chief
Surface Water Quality Bureau
1190 Saint Francis Drive RM N-2050
Santa Fe, New Mexico 87502
(505) 827-2795, Fax (505) 827-2836

New Mexico State University
Box 3AE
Las Cruces, New Mexico 88003-0031

New Mexico Department of Agriculture
Office of the Director/Secretary
Box 30005, Department 3189
Las Cruces, New Mexico 88003-0005
(505) 646-3007

Louisiana

State of Louisiana

Department of Environmental Quality
Office of Water Resources
P. O. Box 82215
Baton Rouge, Louisiana 70884-2215

Louisiana State University

Agricultural Center
P. O. Box 25203
Baton Rouge, Louisiana 70894-5203
(504) 388-4161, Telephone,
(504) 388-4143

Producer Groups

Sample Producer Group Contacts:

National Cattlemen's Association
1301 Pennsylvania Avenue, N.W.
Suite 300
Washington, D. C. 20004-1701
(303) 694-0305

New Mexico Cattle Growers'
Association
2231 Rio Grande Blvd., N.W.
Box 7517
Albuquerque, New Mexico 87194
(505) 247-0584

National Pork Producers Council
P. O. Box 10383
Des Moines, Iowa 50306
(515) 223-2600, Telephone,
(515) 223-2646, Fax

New Mexico Livestock Marketing
Association
Route 3, Box 155T
Stephenville, Texas 76401
(817) 965-2229

Livestock Marketing Association
7509 Tiffany Springs Pkwy.
Kansas City, MO 64153
(816) 891-0502, 1-800-821-2048

Dairy Producers of New Mexico
Box 3AE, NMSU
Las Cruces, New Mexico 88003

National Milk Producers Federation
1840 Wilson Blvd.
Arlington, Virginia 22201
(703) 243-6111, Telephone, (703) 841-
9328

Louisiana Cattlemen's Association
4921 I-10 Frontage Road
Port Allen, Louisiana 70767-4195
(504) 343-3491, Telephone,
(504) 336-0002, Fax

Texas Cattle Feeders Association
5501 West I-40
Amarillo, Texas 79106
(906) 358-3691, Telephone,
(906) 352-6026

Montana Stockgrowers Association
420 North California
P. O. Box 1679
Helena, Montana 59624
(406) 442-3420 or (406) 449-5105

Texas Association of Dairymen
P. O. Box 1115
Stephenville, Texas 76401
(817) 968-5180

Nebraska Cattlemen
204 East 3rd Street
P. O. Drawer 40
Alliance, Nebraska 69301
(308) 762-3005

Poultry Water Quality Consortium
TVA-HB2C
1101 Market Street
Chattanooga, Tennessee 37402
(615) 751-7297

or
Executive Building
Suite 10i
521 South 14th Street
Lincoln, Nebraska 68508
(402) 475-2333

Texas Beef Producers

P. O. Box 1355
Sunray, Texas 79029
(806) 948-4163, Telephone, (806) 948-4502, Fax

Illinois Beef Association

Affiliated with National Cattlemen's Association
993 Clock Tower Drive
Springfield, Illinois 62704
(217) 787-4280, Telephone, (217) 793-3605, Fax

Oklahoma Livestock Marketing Association

P. O. Box 5841
Norman, Oklahoma 73071
(405) 360-0605

Arizona Cattle Feeders' Association

1401 North 24th Street
Suite #4
Phoenix, Arizona 85008
(602) 273-7414

Oklahoma Cattlemen's Association

P. O. Box 82395
Oklahoma City, Oklahoma 73071
(405) 235-4391 or 235-3607, Telephone,
(405) 235-3608, Fax

Kansas Livestock Association

6031 S.W. 37th Street
Topeka, Kansas 66614-5128
(913) 273-5115, Telephone, (913) 273-3399, Fax

Oklahoma Hereford Association, Inc.

Bill Jacobs, President
Box 160
Elgin, Oklahoma 73538
(405) 492-4315 or 492-4706

California Cattlemen's Association

1221 H Street
Sacramento, California 95814-1910
(916) 444-0845

Industries

Sample Industry Contacts:

Texas Farm Bureau

S. M. True, Jr., President
P. O. Box 2689
Waco, Texas 76702-2689
(817) 772-3030

Seaboard Farms of Colorado

121 West 2nd Street
Julesburg, CO. 80737
(303) 474-3351 Phone, (303) 474-2663
FAX

**Oklahoma Association of Conservation
Districts**

Billy Wilson, President
P. O. Box 6123
Oklahoma City, Oklahoma 73146
(918) 768-3542

Koch Agriculture Company, Inc.

P. O. Box 2256
Wichita, Kansas 67201
(316) 832-4007

Oklahoma Farm Bureau

2501 North Stiles
Oklahoma City, Oklahoma 73105-3196
(405) 523-2300

ConAgra Broiler Company

422 North Washington
P. O. Box 1997
El Dorado, Arkansas 71731
(501) 863-1600

New Mexico Farm and Livestock Bureau

421 North Water Street
Las Cruces, New Mexico 88001
(505) 526-0858, Telephone, (505) 525-
0858, Fax

Growmark

P. O. Box 2500
Bloomington, IL 61702-2500
(309) 557-6000

Louisiana Farm Bureau Federation

P. O. Box 95004
Baton Rouge, Louisiana 70895-9004

The Fertilizer Institute

501 Second Street, N.E.
Washington, D. C. 20002
(202) 675-8250, Telephone, (202) 544-
8123, Fax

Tyson Foods, Inc.

P. O. Box 2020
Springdale, Arkansas
(501) 756-4000

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Appendix C. Communication Strategy Survey

Dear Survey Participant:

A workgroup of Federal and State Representatives is currently examining ways to improve communication with producer organizations, contractors, and other Federal and State agencies. We are assessing the potential for using existing avenues of communication to provide feeding operators with updated information about Federal regulatory programs, financial assistance, environmental awards, and appropriate environmental practices.

The attached survey is being conducted to determine the availability of existing communications lines to operators of animal/feeding production facilities. The workgroup would like your input to help us ascertain the availability of existing communications channels, and gather data that will help plan for the best use of those channels.

Please complete the survey and return by _____ to the workgroup. You may fax your response at the number listed on the survey, or, if you would prefer, please mail to:

Feedlot Workgroup
c/c Jackie Hanson, Mailcode EN-338
U.S. EPA
401 M Street, SW
Washington, D.C. 20460

Thank you very much for your assistance, and we look forward to working with you to improve communications.

Sincerely,

Paulette Johnsey
Workgroup Chair

Attachment

COMMUNICATIONS SURVEY: ANIMAL FEEDING OPERATIONS

Please fax this form to the Feedlot Workgroup, fax (202) 260-5282. Thank you!

1. Name of organization, address, and contact person for communications bulletins:

2. Type of organization: Public company Member association
 Private bureau State or Federal agency Other _____

3. What written communications strategies does your organization use?

Type	Frequency (please circle one)			
<input type="checkbox"/> Newsletter	weekly	monthly	quarterly	annually
<input type="checkbox"/> Magazine	weekly	monthly	quarterly	annually
<input type="checkbox"/> Mailouts	weekly	monthly	quarterly	annually
<input type="checkbox"/> Technical guidance	weekly	monthly	quarterly	annually
<input type="checkbox"/> Other (please describe)	_____			

4. What types of personal communication does your organization provide to operators/producers?

Type	Frequency (please circle one)				
<input type="checkbox"/> On-site visits	weekly	monthly	quarterly	annually	as needed
<input type="checkbox"/> Telephone calls	weekly	monthly	quarterly	annually	as needed
<input type="checkbox"/> Workshops or seminars	weekly	monthly	quarterly	annually	as needed
<input type="checkbox"/> Other (please describe)	_____				

5. What types of electronic/video communications does your organization use to communicate with operators/producers?

Electronic bulletin boards Education/Information videos
 Video conferencing Other (please describe) _____

6. Which of the following information specific to animal feed/production facilities, if provided by EPA, would be helpful to your members/constituency to operate their facilities in an environmentally aware manner? (check all applicable items)

Educational materials on environmental hazards
 Explanation of environmental regulations
 Information/update on loans/grants
 Information/update on environmental awards
 Description of new environmental practices
 Other (please describe) _____

7. Would your organization be willing to distribute information provided by EPA in your newsletter, mailouts, technical outreach vehicles, etc?

Yes No Undecided

8. Does your organization believe that this approach could influence producers to operate their facilities in a more environmentally aware manner?

Yes No Undecided