The Emerging Legal Framework for Animal Agricultural Waste Management in Arkansas

by

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INTRODUCTION

Arkansas is a major poultry and livestock producing state. It leads the nation in the production of broiler chickens, with approximately 1 billion birds raised each year, and ranks sixth in egg production and fourth in the production of turkeys. Arkansas farmers produce substantial numbers of hogs and beef cattle as well, and the state has a significant dairy industry.[1]

This level of poultry and livestock production generates significant amounts of animal waste. In 1989, Arkansas livestock and poultry produced an estimated 4.32 million tons of manure.[2] [See Table 1]. During poultry production, poultry excreta mixes with feathers and bedding material, usually wood shavings, to create poultry litter. In 1991, broiler production alone generated over 980,000 dry tons of

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1. In 1991, Arkansas livestock and poultry growers produced 980.2 million birds, a new record high. Egg production rose to 3.7 billion eggs. Turkey production increased to a record high of 24 million birds. The hog and pig inventory was 760,000 animals. The January 1, 1992 inventory of cattle and calves was 1.71 million animals. The state's dairy industry included 69,000 milk cows. Preliminary cash receipts from the sale of livestock and poultry products totaled $2.57 billion. ARKANSAS AGRICULTURAL STATISTICS SERVICE, ARKANSAS AGRICULTURAL EXPERIMENT STATION REPORT SERIES NO. 323, ARKANSAS AGRICULTURAL STATISTICS 1991, at 2 (1992).

2. ARKANSAS SOIL & WATER CONSERVATION COMM'N, NONPOINT SOURCE MANAGEMENT STATUS REPORT NO. 2, at 4 (June-July 1991).

poultry litter, an amount of waste nearly six times the human waste produced by the population of New York City per year.[3] In addition, the disposal of dead animals not suitable for human consumption is a significant problem. Consider, for example, broiler production. Assuming a total production of 1 billion birds per year and a conservative mortality rate of three percent, Arkansas farmers must dispose of nearly 30 million broiler carcasses each year.[4]

With proper handling and management, livestock and poultry wastes are potentially valuable inputs in agricultural operations. Both manure and dead animals can be composted, rendered, or processed in order to retrieve nutrients for use as fertilizer or animal feed. Improper disposal, however, creates serious environmental problems.

This article focuses on the developing legal framework for addressing these problems. Part I describes the nature of the environmental problems associated with animal agricultural waste, and Part II focuses on the developing federal regulatory scheme for dealing with these environmental problems. Under the authority of the federal Clean Water Act, the United States Environmental Protection Agency (EPA) is increasing its efforts to control water pollution from animal agricultural operations. In 1990, Congress added provisions to the Coastal Zone Management Act (CZMA) to deal with agricultural water pollution as a preliminary step to addressing agricultural pollution in the reauthorization of the Clean Water Act. In addition, the Safe Drinking Water Act establishes drinking water standards for pollutants, including those generated by agricultural animal production. Finally, federal wildlife law prohibits animal agricultural waste disposal which results in the death or injury of protected wildlife.

Part III of the article examines the state regulatory scheme which is emerging in Arkansas for controlling

3. Duane C. Wolf, *Impact of Human and Animal Waste on Water Quality, in* ARKANSAS AND THE NATURAL ENVIRONMENT: WATER, WASTE AND WAR at 18, 20 (Proceedings of the Second Annual Agricultural Issues Symposium, Arkansas Agricultural Experiment Station Special Report No. 154, 1992).

4. T.C. Daniel, D.R. Edwards, D.J. Nichols, K.F. Steele & S. Wilkes, WATER QUALITY AND POULTRY DISPOSAL PITS 1 (Arkansas Water Resources Center Fact Sheet No. 2, 1992).

animal agricultural waste. Environmental problems from animal agricultural production are addressed not only by regulatory systems but also by common law tort actions. Part IV of this article investigates the common law doctrines and cases relevant to animal agricultural waste in Arkansas. This section also examines the statutory defense to these actions provided by the Arkansas Right-to-Farm Act. The limitation placed by this Act on the ability of local governments to defuse potential common law conflicts through zoning and planning ordinances is also addressed. Part V of the article discusses the organization of the livestock and poultry sectors, particularly the contractual relations between growers and processors, and the implication of this organization for pollution liability and regulation.

This article concludes that while Arkansas has made significant progress in developing programs to deal with some aspects of animal waste production and disposal, a number of additional steps may be necessary if animal production continues to expand in the state. Two specific legislative actions are suggested: (1) repeal of the agricultural exemption in the state air pollution legislation, and (2) modification of the Right-to-Farm Act to allow local governments to deal with agricultural land use questions as a part of comprehensive county-wide planning and zoning.

In addition, the potential success of voluntary and cooperative efforts appears promising and such efforts deserve support. Regulation is but a tool to complement such efforts — not an end to itself. However, the reauthorization of the Clean Water Act may call for mandatory nonpoint pollution controls. If so, Arkansas will have to develop programs that go beyond the voluntary Best Management Practices now being developed. The emerging view of the EPA regarding concentrated animal feeding operations may force expansion of regulatory efforts as well.

I. ENVIRONMENTAL PROBLEMS RELATED TO ANIMAL AGRICULTURAL WASTES

A. Animal Production Systems

Animal agricultural operations can be divided into two major categories: (1) confined or concentrated feeding op-

erations where animals are kept in enclosed facilities throughout most or all of their lives, and (2) unconfined operations where animals are maintained on pastures and allowed to forage at will or are provided feed in relatively open settings. Examples of concentrated animal production systems include poultry and hog confinement houses, livestock feedlots, and dairy operations with confinement facilities.

Concentrated animal production systems often separate meat and egg production facilities from animal feed production facilities. This decoupling breaks the traditional agricultural cycle of animal waste being returned as nutrients to a crop system, which in turn provides animals with food. The most common method of animal waste disposal from concentrated feeding operations, however, is still land application.[5] Animal producers apply the waste to their own land or arrange to have the waste applied to other land. Environmental problems arise when animal producers do not have control of or access to land with the requisite amount or type of vegetation and soil to absorb and utilize the applied waste.[6] Additional problems may arise if waste is stored or processed improperly, particularly if the concentrated feeding operation involves large amounts of animals and waste.

Animal mortality during production is another major problem of concentrated animal operations. Under favorable conditions, animal production operations experience a relatively low rate of mortality. Even a low mortality rate, however, can result in large numbers of dead animals. Animal operations may suffer catastrophic mortality rates as a result of factors such as heat waves, disease epidemics, and the collapse of confinement houses during snow or ice storms. These events can result in the death of

5. H. Don Scott, *Fate of Nitrogen and Phosphorus After an Application of Poultry Litter to Tall Fescue*, *in* PROCEEDINGS OF THE AWRRC RESEARCH CONFERENCE 36 (Arkansas Agricultural Experiment Station Special Report No. 157, 1992).

6. Darrell J. Bosch & Krishna B. Napil, *Economics of Transporting Poultry Litter to Achieve More Effective Use as Fertilizer*, 47 J. SOIL & WATER CONSERVATION 342 (1992).

thousands of animals over a short-term period in a relatively small geographic area.[7]

In unconfined animal production systems, animal waste from grazing animals is applied directly to the land. Some manure may run off of the land and enter streams and other waterways. Grazing animals may also enter streams and creeks, particularly in hot weather, and deposit waste directly into the water. Stream banks may erode if the animals graze off most of the streambank vegetation or trample streambanks getting in and out of the water. This erosion can result in increased sediment loading in the water. Livestock in water also churn up streambed sediments.[8] Depending on the concentration and number of animals, the capacity of the stream, and other factors, these practices may lead to water quality problems. The same geographic region can support confined and unconfined animal production operations. For example, in western Arkansas the most common method for disposing of poultry litter from poultry houses is by broadcast application on tall fescue or bermuda grass pastures used in cattle grazing operations.[9]

Potential environmental problems associated with animal agriculture waste can be divided into general categories of water pollution, air pollution, and promotion of human and wildlife disease vectors. A brief explanation of the nature of these problems provides background for the discussion of the developing legal framework for their control.

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7. *See, e.g.*, Patricia May, *Storm Batters Livelihood of Area Poultry Growers*, SPRINGDALE MORNING NEWS, Feb. 20, 1993, at 1A, 2A (report that over 200,000 birds were killed in Washington, Benton, and Madison Counties in Arkansas during a single winter storm that destroyed or damaged many area poultry houses).

8. For general information on environmental problems associated with unconfined livestock operations, *see, e.g.*, Richard H. Braun, *Emerging Limits on Federal Management Discretion: Livestock, Riparian Ecosystems, and Clean Water Law*, 17 ENVTL. L. 43 (1986); John M. Sweeten & Stewart W. Melvin, U.S. ENVIROMENTAL PROTECTION AGENCY, *Controlling Water Pollution From Nonpoint Source Livestock Operations*, PERSPECTIVES ON NONPOINT SOURCE POLLUTION 215, 215-7 (1985).

9. Duane C. Wolf, *Impact of Human and Animal Waste on Water Quality*, ARKANSAS AGRICULTURAL EXPERIMENT STATION SPECIAL REPORT NO. 154 (1992).

B. Water Pollution

1. Public Health Problems: Water Borne Pathogens and Nitrate

Pathogens posing the greatest concern include enterococcal bacteria, viruses, and protozoans such as *Giardia* and *Cryptosporidium*.[10] The introduction of microorganisms found in animal waste into surface or groundwater pose a significant public health issue, as many are pathogenic to humans. The presence of pathogenic bacteria in drinking water generally is not measured directly. Instead, the EPA uses the presence of one group of bacteria, fecal coliforms, to indicate that other pathogenic microorganisms may also be present in the water.[11] Surface and groundwaters with high fecal coliform levels must be treated before being used as a drinking water source.

In addition, surface waters with high levels of pathogenic microorganisms cannot be used safely for primary

10. SOIL CONSERVATION SERVICE, U. S. DEP'T OF AGRIC., WATER QUALITY INDICATORS GUIDE: SURFACE WATERS 33 (1989). For a general discussion of pathogens which may be present in U.S. drinking water sources, *see, e.g.*, Drinking Water; National Primary Drinking Water Regulations; Total Coliforms (Including Fecal Coliforms and E. coli), 54 Fed. Reg. 27544 (1989); Drinking Water; National Primary Drinking Water Regulations; Filtration, Disinfection; Turbidity, Giardia lamblia, Viruses, Legionella, and Heterotrophic Bacteria, 54 Fed. Reg. 27486 (1989).

Public awareness recently focused on the potential adverse effects of contamination of drinking water supplies by animal waste. In April 1993, the Milwaukee, Wisconsin water system was infected by the protozoan parasite *Cryptosporidium*. Public health officials suspect, but have not confirmed, that the parasite came from manure washed from area farms into Lake Michigan, the source of the city's drinking water. Over 100,000 people suffered gastrointestinal illness from the parasite, which caused at least one death. *Cryptosporidium* has caused other epidemics in the United States, including an outbreak in Jackson County, Oregon affecting 15,000 people and an outbreak in Carrollton, Georgia. *Milwaukee Water Fouled by Parasite*, FACTS ON FILE WORLD NEWS DIGEST, Apr. 29, 1993 *available in* LEXIS, Nexis Library. Generally, filtration and disinfection measures prevent drinking water contamination. Many cities, however, do not filter their water. The largest is New York City, which relies on watershed protection to prevent protozoan contamination of its reservoirs. Albert F. Appleton, *Unfiltered 'Champagne,'* NEWSDAY, May 11, 1993, at 42. Eleven Milwaukee residents have filed a class action lawsuit against the city for alleged injuries from the city's distribution of impure water. *Water Suits Filed*, NAT'L LAW J., May 3, 1993, at 6.

Note that the federal government has not promulgated a regulation requiring that public water supplies monitor specifically for *Cryptosporidium* contamination.

11. National Primary Drinking Water Regulations: Analytical Techniques; Coliform Bacteria, 57 Fed. Reg. 24744 (1992).

contact recreational activities such as swimming. The EPA has established bacteriological ambient water quality criteria based on counts of both fecal coliform and enteroccocal bacteria.[12]

High nitrate levels in drinking water, which may result from contamination by animal waste, also pose a public health threat. Infants are particularly susceptible to high nitrate levels and may develop methemoglobinemia, a blood disorder associated with high nitrate intake.[13] Recent surveys of rural wells in Arkansas indicate that high nitrate readings are correlated with high levels of livestock and poultry production. These nitrate levels have exceeded the EPA's public health advisory level of 10 mg/liter in some wells.[14]

2. Nutrient Loading: Water Quality Degradation and Eutrophication

The introduction of nutrients into surface waters is a major water pollution problem associated with animal waste runoff. The most important nutrients in water systems are phosphorus and nitrogen, substances naturally present in aquatic ecosystems. An increase of nutrients naturally present in limited supply, particularly phosphorus, or a change in the balance of phosphorus and nitrogen, can stimulate phytoplankton and algal blooms and other vegetative growth.[15] The presence of some of these

12. Bacteriological Ambient Water Quality Criteria; Availability, 51 Fed. Reg. 8012 (1986).

13. The higher sensitivity of infants to nitrates is attributed to the presence in their digestive tracts of bacteria which convert nitrates to toxic nitrites. Scientific studies, although not conclusive, suggest that elevated nitrate intake in adults may be associated with cancers and neurosystem disorders. U.S. DEP'T OF AGRIC., NITRATE OCCURRENCE IN U.S. WATERS AND RELATED QUESTIONS at 29-30 (Sept. 1991).

14. ARKANSAS DEP'T OF POLLUTION CONTROL & ECOLOGY, WATER QUALITY INVENTORY REPORT 1992, at 56-60 (1992).

15. *See, e.g.*, U.S. DEP'T OF AGRIC., NITRATE OCCURRENCE IN U.S. WATERS AND RELATED QUESTIONS at 31-2 (1991); Susan Soltau Kilham & Peter Kilham, *The Importance of Resource Supply Rates in Determining Phytoplankton Community Structure*, *in* TROPHIC INTERACTIONS WITHIN AQUATIC ECOSYSTEMS at 7-27 (Dewey G. Meyers & J. Rudi Strickler eds., 1984).

organisms can render water unfit for drinking or for recreational use.[16]

Increased vegetative growth may also deplete oxygen levels in the water, either through direct oxygen uptake by living organisms, or through oxygen depletion when dead materials decay. This oxygen depletion can lead to massive fish kills and long-term changes in the types of plants and animals in the water system. Additional organic materials in animal waste runoff may increase the biochemical oxygen demand in the aquatic system, thereby depleting oxygen available to other organisms. As a result of increased nutrient levels, eutrophication, the process by which lakes and other bodies of water are transformed into marshes or terrestrial ecosystems, can accelerate greatly.[17]

The Arkansas Department of Pollution Control & Ecology (DPC&E), which monitors the quality of the state's waters, is particularly concerned with the problems of nutrient loading from animal waste. Many of the confined poultry and hog facilities in the state, as well as beef cattle production operations, are located in the northern and western regions of Arkansas. These areas also contain the state's highest quality watersheds, which are the foundation of a growing tourist industry.[18]

C. Air Pollution

Odor is the air quality problem most often associated with animal waste, particularly when the waste is concentrated in holding lagoons or when land applied. In addition, animal waste gives off ammonia, methane, and other noxious gases.[19]

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16. SOIL CONSERVATION SERVICE, U.S. DEP'T AGRIC., WATER QUALITY INDICATORS GUIDE: SURFACE WATERS at 27 (1989).

17. *Id.* at 23-28.

18. ARKANSAS DEP'T OF POLLUTION CONTROL & ECOLOGY, WATER QUALITY INVENTORY REPORT 1992, at 4-5 (1992).

19. Syed A. Bokhari, *Some Environmental Complaints Are About Nuisances*, FEEDSTUFFS, Nov. 30, 1992, at 13-14.

D. Disease Vectors

In addition to water and air pollution problems, improperly handled animal waste attracts flies and other vermin and serves as a breeding site for these pests and other human disease vectors. These pests can both threaten the public and irritate neighboring residents.[20]

Decaying animals dumped openly also serve as reservoirs for wildlife diseases. In particular, decaying avian carcasses are production sites for botulin toxin, a neurotoxin produced by the bacterium *Clostridium botulinum*.[21] This problem came to the forefront in Arkansas in 1992 when the U.S. Fish and Wildlife Service concluded that over thirty owls, hawks, and other birds became sick or died from botulism after feeding on chicken carcasses illegally dumped at an open site.[22]

II. FEDERAL REGULATION OF ANIMAL AGRICULTURAL WASTES

Federal attention to agricultural animal waste issues has focused on water pollution problems. Water pollution is primarily addressed by three federal statutes: the Clean Water Act, the Coastal Zone Management Act, and the Safe Drinking Water Act. The air pollution problem of odor is not addressed by the Federal Clean Air Act and is solely a matter of state law. Likewise, the control of non-water-borne disease vectors is generally a matter of state law, unless federally protected wildlife is harmed.

A. Federal Clean Water Act and Animal Agricultural Operations

The federal Clean Water Act prohibits the discharge of any pollutant into the surface waters of the United States, unless the discharge complies with the provisions of the Act.[23] The Act divides water pollution sources into two

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20. *Id.*

21. Thomas M. Reed & Tonie E. Rocke, *The Role of Avian Carcasses in Botulism Epizootics*, 20 WILDLIFE SOC. BULL. 175, 175-76 (1992).

22. D.R. Stewart, *Firm Orders Dead Birds Composted*, ARK. DEMOCRAT-GAZETTE, Dec. 22, 1992, at D1, D6.

23. 33 U.S.C. § 1311(a) (1988).

general categories: point and nonpoint sources.[24] Point sources are regulated through the National Pollutant Discharge Elimination System (NPDES), a mandatory permit program.[25] The Act provides that upon EPA approval, a state may administer NPDES permits in a manner no less strict than that provided for by federal regulation.[26] In 1986, the EPA granted the state of Arkansas authority to administer its NPDES program.[27]

The Clean Water Act addresses nonpoint source water pollution through programs of state monitoring, assessment, and management subject to review and approval by the EPA.[28] The Act, however, neither requires nor prohibits states from undertaking mandatory control of nonpoint sources of pollution. Depending on the size of the operation, the length of time that animals are confined in a discrete location, and the method of disposing of animal waste, an animal agricultural operation may qualify as either a point source or a nonpoint source under the Act.

1. Animal Agriculture and Point Source Water Pollution Regulation

The Clean Water Act expressly provides that concentrated animal feeding operations are point sources of pollution.[29] Concentrated animal feeding operations, which

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24. The Clean Water Act defines a point source as:

> . . . any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged. This term does not include agricultural stormwater discharges and return flows from irrigated agriculture.

33 U.S.C. § 1362(14) (Supp. IV. 1992).

The Clean Water Act does not expressly define "nonpoint source."

25. 33 U.S.C. § 1342 (1988 & Supp. IV. 1992).

26. 33 U.S.C. § 1342(b) (1988).

27. Approval of Arkansas' NPDES Program, 51 Fed. Reg. 44518 (1986). The NPDES system is administered in Arkansas by the Department of Pollution Control and Ecology under the authority of the Arkansas Water and Air Pollution Control Act. ARK. CODE ANN. §§ 8-4-101 to -313 (Michie 1987). DPC&E Regulation No. 6 implements state administration of the NPDES system and incorporates by reference the federal regulations. *See* 40 C.F.R. § 123.25 (summary of federal requirements for state administration of the NPDES program).

28. *See* 33 U.S.C. §§ 1288, 1329 (1988 & Supp. IV. 1992).

29. 33 U.S.C. § 1362(14) (Supp. IV. 1992).

require NPDES permits, are defined by regulations according to the number of animals in the operation and other criteria. "Animal feeding operations" are defined by regulations as lots or facilities "where the following conditions are met: (i) 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 (ii) crops, vegetation forage growth, or post-harvest residues are not sustained in the normal growing season over any portion of the lot or facility."[30] "Concentrated" animal feeding operations are defined by the number of animals at the facility[31] or as des-

30. 40 C.F.R. § 122.23(b)(1) (1992). The regulation also provides that "two or more animal feeding operations under common ownership are considered, for the purposes of these regulations, to be a single animal feeding operation if they adjoin each other or if they use a common area or system for the disposal of wastes." 40 C.F.R. § 122.23(b)(2).

31. The regulations provide that an animal feeding operation is a concentrated animal feeding operation for purposes of 40 C.F.R. § 122.23 when, without regard to whether there is a direct discharge of pollutants, more than the numbers of animals specified in any of the following categories are confined:

(1) 1,000 slaughter and feeder cattle,
(2) 700 mature dairy cattle (whether milked or dry cows),
(3) 2,500 swine each weighing over 25 kilograms (approximately 55 pounds),
(4) 500 horses,
(5) 10,000 sheep or lambs,
(6) 55,000 turkeys,
(7) 100,000 laying hens or broilers (if the facility has continuous overflow watering),
(8) 30,000 laying hens or broilers (if the facility has a liquid manure system),
(9) 5,000 ducks, or
(10) 1,000 animal units.

40 C.F.R. § 122, app. B.

If pollutants are discharged into navigable waters through a manmade ditch, flushing system or other similar man-made device or if pollutants are discharged directly into waters of the United States which originate outside of and pass over, across, or through the facility or otherwise come into direct contact with the animals confined in the operation, the operation is a concentrated feeding operation where the following number and types of animals are confined:

(1) 300 slaughter or feeder cattle,
(2) 200 mature dairy cattle (whether milked or dry cows),
(3) 750 swine each weighing over 25 kilograms (approximately 55 pounds),
(4) 150 horses,
(5) 3,000 sheep or lambs,
(6) 16,500 turkeys,
(7) 30,000 laying hens or broilers (if the facility has continuous overflow watering),
(8) 9,000 laying hens or broilers (if the facility has a liquid manure handling system),

ignated by an EPA Regional Director on a case-by-case basis.[32] The regulations exempt from the NPDES permit program operations which discharge effluent only in the event of a twenty-five-year, twenty-four-hour storm.[33]

Many animal feeding operations in Arkansas are designed so that effluent is not discharged directly into

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(9) 1,500 ducks, or
(10) 300 animal units.
Id.

The term "animal unit" means a unit of measurement for any animal feeding operation calculated by adding the following numbers: the number of slaughter and feeder cattle multiplied by 1.0, plus the number of mature dairy cattle multiplied by 1.4, plus the number of swine weighing over 25 kilograms (approximately 55 pounds) multiplied by 0.4, plus the number of sheep multiplied by 0.1, plus the number of horses multiplied by 2.0. *Id.* The term "manmade" means constructed by man and used for the purpose of transporting wastes. *Id.*

32. EPA Regional Directors may designate an animal feeding operation as a concentrated animal feeding operation on a case-by-case designation if the Director determines that it is a significant contributor of pollution to the waters of the United States.

> In making this designation, the Director shall consider the following factors:
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> (i) The size of the animal feeding operation and the amount of wastes reaching waters of the United States;
>
> (ii) The location of the animal feeding operation relative to waters of the United States;
>
> (iii) The means of conveyance of animal wastes and process waste waters into waters of the United States;
>
> (iv) The slope, vegetation, rainfall, and other factors affecting the likelihood or frequency of discharge of animal wastes and process waste waters into waters of the United States; and
>
> (v) Other relevant factors.

40 C.F.R. § 122.23(c)(1).

> No animal feeding operation with less than the numbers of animals set forth in Appendix B of this part shall be designated as a concentrated animal feeding operation unless:
>
> (i) Pollutants are discharged into waters of the United States through a manmade ditch, flushing system, or other similar manmade device; or
>
> (ii) Pollutants are discharged directly into waters of the United States which originate outside of the facility and pass over, across, or through the facility or otherwise come into direct contact with the animals confined in the operation.

40 C.F.R. § 122.23(c)(2).

The EPA Regional Director must conduct an on-site inspection of the operation and determine that the operation should and could be regulated under the NPDES permit program before requiring that the operation have an NPDES permit application. 40 C.F.R. § 122.23(c)(3).

33. Best Achievable Technology guidelines for concentrated animal feeding operations are found at 40 C.F.R. § 412.13(b) (1992).

water. Animal waste and waste water are stored in lagoons or taken from confinement facilities and applied to land rather than discharged directly into the waters of the state.

Recently, EPA Region VI, which includes Arkansas, developed a new NPDES general permit for concentrated animal feeding operations.[34] This new general permit establishes requirements for storing wastes and waste water and for controlling runoff from the area where animals are concentrated. These requirements are clearly within the authorization of the Clean Water Act and the concentrated animal feeding operation regulations. The general permit goes further, however, by establishing requirements for land application of manure and wastewater. Applicants must show that they have adequate land to dispose of waste with regard to uptake of nitrogen and phosphorus by plants, absorption of nutrients by the soil, and topographical conditions. In essence, the permit requirements prohibit land application of wastewater or manure if application is in excess of recommended agricultural rates and the potential exists for runoff of pollutants into waters of the United States.[35]

EPA Region VI may have exceeded its authority by issuing the land application requirements. The Clean Water Act definition of "point source" exempts both agricultural stormwater discharges and irrigation return flows.[36] In addition, the regulatory definition of "animal feeding operation" is limited to areas without crops or other vegetation forage growth, or where post-harvest residues are not sustained in the normal growing season over any portion of the lot or facility.[37] These exemptions indicate that both Congress and the EPA, at the national level, did not intend for the NPDES program to extend to land application sites that are a part of an agricultural operation.[38]

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34. National Pollutant Discharge Elimination System General Permit and Reporting Requirements for Discharges From Concentrated Animal Feeding Operations, 58 Fed. Reg. 7610 (1993).

35. *Id.* at 7631-33.

36. 33 U.S.C. § 1362(14) (1988).

37. 40 C.F.R. § 122.23(b)(1).

38. Further indication that land application of animal waste is not subject to the NPDES program is provided in a recent EPA report which states:

In *Concerned Area Residents for the Environment v. Southview Farm*,[39] a United States district court recently adopted the position that runoff of manure from fields on which the manure had been applied from tankers pulled by tractors did not constitute point source water pollution subject to NPDES permit requirements. The case involved a Clean Water Act citizen suit brought by neighbors of a dairy operation which land applied manure to fields. The manure ran off the fields into an adjacent stream. The plaintiffs complained that the dairy operation was in violation of the Clean Water Act for discharging pollutants from a point source without an NPDES permit.[40]

After a jury verdict for the plaintiffs, the defendants moved for judgment as a matter of law, claiming that the manure runoff from the fields was not a point source. The court agreed with the defendants and reversed the judgment with regard to the Clean Water Act claims.[41] First, the court found that manure runoff from fields as a result of stormwater runoff was exempted from the definition of point source by the statutory exemption for agricultural stormwater discharges. The court further found that manure runoff from the fields, even in the absence of stormwater discharge, was a nonpoint discharge rather than a point source discharge of pollutants. The court reasoned that the spreading of manure on the field was a dispersal of pollutants rather than a system for gathering or channelling pollutants into the stream.[42] The court did note that under some circumstances the dumping of manure on the ground

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> While the NPDES program can move manure into a controlled storage structure, no farmer is specifically required to under take further BMPs [Best Management Practices] when the manure is taken out of storage. Therefore, the farmer can encourage runoff of these wastes by applying them to cropland at rates that exceed crop uptake or during the most environmentally unsound times of the year (e.g., winter).

OFFICE OF WATER, U.S. ENIVIROMENTAL PROTECTION AGENCY, MANAGING NONPOINT SOURCE POLLUTION 189 (1992).

39. No. 91-CV-6031L, 1993 WL 427375 (W.D.N.Y.)

40. *Id.* at 1-3.

41. *Id.* at 11. The plaintiffs also brought a state law claim for trespass, alleging that the manure runoff had contaminated their wells with nitrates. The jury verdict for this claim was also for the plaintiffs, and the court denied the motion for judgment as a matter of law on this claim.

42. *Id.* at 11-12.

could result in a point source discharge. For example, release of manure poured into a dike at the edge of a river could result in a point source discharge, and dumping manure directly into a river would clearly constitute a point source discharge.[43]

The exact effect of the Region VI general permit for concentrated animal feeding operations in Arkansas is uncertain. The permit applies directly to feeding operations in the states in Region VI that do not have authorized NPDES programs: Oklahoma, Louisiana, New Mexico, and Texas.

EPA Region VI did indicate in the public notice of the permit that states which administer the NPDES program, such as Arkansas, must control concentrated animal feeding operations with the same degree of stringency and in a manner consistent with the federal regulations.[44] Currently, under state law, Arkansas requires a permit for liquid animal waste management systems which is similar in many features to the Region VI general permit.[45] The Arkansas permit covers breeding hen operations, hog houses, and dairy operations but does not extend to broiler houses because they produce dry rather than liquid waste. The EPA's concentrated animal feeding operation regulations include laying hen or broiler facilities only if they have continuous overflowing water or liquid manure systems.[46] EPA Region VI, however, believes that broiler poultry operations which stockpile or land dispose of dry manure in such a manner that rainwater or adjacent watercourses transfer significant amounts of pollutants to the waters of the United States have essentially established a crude liquid manure handling system. If these operations meet the other criteria of concentrated animal feeding, Region VI considers them to be

43. *Id.* at 13.

44. 58 Fed. Reg. 7610, 7612 (1993).

45. ARKANSAS DEP'T OF POLLUTION CONTROL & ECOLOGY, REG. NO. 5: LIQUID ANIMAL WASTE MANAGEMENT SYSTEMS (July 1992). For a detailed discussion of DPC&E Regulation No. 5, *see infra* text accompanying notes 89-103.

46. 40 C.F.R. § 122, app. B; *see also* U.S. ENVIROMENTAL PROTECTION AGENCY, MANAGING NONPOINT SOURCE POLLUTION at 188 (1992) (poultry facilities with dry manure handling operations not considered by EPA to be concentrated animal feeding operations subject to NPDES regulation).

point sources subject to the new general permit requirements.[47] The Arkansas DPC&E and Region VI have yet to announce what exact requirements, if any, will be imposed on Arkansas producers as a result of the new general permit program, but the agencies are developing a similar program for Arkansas.

2. Animal Agriculture Nonpoint Source Pollution Regulation

Water pollution from operations that are not subject to NPDES point source permit requirements is addressed under provisions of the Clean Water Act for managing nonpoint source pollution. Agriculture, including both crop and animal production, is the single largest contributor to nonpoint source pollution and the leading source of nonpoint source pollution effects on rivers, lakes, and wetlands.[48]

Agriculture is also a major contributor of nonpoint source pollution to surface waters and groundwater in Arkansas. A recent assessment of the state's water quality, required by section 305(b) of the Clean Water Act,[49] concluded that animal agricultural operations are a major source of pollution in waters of the Ozark Highlands Region in the northern portions of the state. This report noted that a high level of animal production in the region is coupled with a fractured limestone geology that allows rapid runoff or leaching of land applied animal waste. Nitrate levels in the Region's waters are consistently high, and few streams meet the water quality standards for primary con-

47. 58 Fed. Reg. 7610, 7617 (1993).

48. U.S. ENVIROMENTAL PROTECTION AGENCY, MANAGING NONPOINT SOURCE POLLUTION at 2 (1992). For a comprehensive review of agricultural nonpoint source pollution and federal law, *see* George A. Gould, *Agriculture, Nonpoint Source Pollution, and Federal Law*, 23 U.C. DAVIS L. REV. 461 (1990).

49. 33 U.S.C. § 1315(b) (1988). The Clean Water Act requires that states submit a report to the EPA every two years which provides an assessment of the state's water quality. The report must include a description of the nature and extent of nonpoint sources of pollutants, with recommendations for state programs to control each category of nonpoint source pollution. 33 U.S.C. § 1315(b)(1)(E) (1988).

tact recreation, such as swimming, because of high fecal coliform bacteria concentrations.[50]

In addition to the state water quality assessments required by section 305(b), Congress has enacted two additional major provisions for addressing nonpoint source agricultural pollution. The first program, established under section 208 of the Clean Water Act, requires each state to develop management plans for areas within the state that have significant water quality problems. The management plan requires assessment of both point source and nonpoint source problems. With regard to nonpoint source agricultural water pollution, the management plan requires identification of pollution sources such as return flows from irrigated agriculture, runoff from manure disposal areas, and runoff from land used for livestock and crop production. Section 208 further requires that states specify feasible measures for controlling nonpoint source agriculture pollution, including land use measures.[51] Section 208 also establishes a Rural Clean Water program, under which the USDA enters into cost sharing contracts with agricultural producers to implement voluntary best management practices (BMPs) for the reduction of agricultural nonpoint source pollution.[52] Few section 208 state management plans have gone further than encouraging farmers and ranchers to adopt voluntary BMPs as a means for controlling nonpoint source agricultural pollution.

The Water Quality Improvement Act of 1987[53] added the section 319 nonpoint source management program to the Clean Water Act. This section added the following new policy statement to the Clean Water Act's goals and policy provision:

> . . . it is the national policy that programs for the control of non-point sources of pollution be developed and implemented in an expeditious manner so as to enable the

50. ARKANSAS DEP'T OF POLLUTION CONTROL & ECOLOGY, WATER QUALITY INVENTORY REPORT 1992 at 68 (1992).

51. 33 U.S.C. § 1288(b)(2)(F) (1988).

52. 33 U.S.C. § 1288(j) (1988).

53. Water Quality Act of 1987, Pub. L. No. 100-4, 101 Stat. 7 (1989), codified at 33 U.S.C. § 1329 (1988).

> goals of this Chapter to be met through the control of both point and non-point sources of pollution.[54]

Section 319 does not require states to implement mandatory regulatory controls. However, the new policy statement indicates increasing congressional concern over the effects of nonpoint source pollution on water quality in the nation. Additionally, the section 319 program does require that states identify waters which cannot be expected to attain or maintain water quality standards without additional action to control nonpoint sources of pollution.[55] Section 319 reports also must include state and local programs for controlling nonpoint source pollution, including the identification of the "best management practices and measures" which can be undertaken to reduce pollution from nonpoint sources.[56]

In Arkansas, the DPC&E is charged with the primary authority to prepare section 319 assessment reports.[57] In its most recent update to the state's report, the agency noted that designated uses of many of the state's assessed stream miles were impaired by nonpoint source pollutants, including nutrients, silt, and microorganisms from pastures and confined animal operations.[58] The report noted the concerns of the Arkansas Soil and Water Conservation Commission (ASWCC) that all Arkansas watersheds with

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54. 33 U.S.C. § 1251(a)(7) (1988).

55. The Clean Water Act requires that each state establish water quality standards which consist of designated uses and water quality criteria for the state's surface waters. State water quality standards are subject to the EPA's review and approval. 33 U.S.C. § 1313(c) (1988); *see also* ARKANSAS DEP'T OF POLLUTION CONTROL & ECOLOGY, REG. NO. 2: REGULATION ESTABLISHING WATER QUALITY STANDARDS FOR SURFACE WATERS OF THE STATE OF ARKANSAS.

56. BMPs are defined in the Clean Water Act regulations as:

> Methods, measures or practices selected by an agency to meet its non-point source control needs. BMPs include but are not limited to structural and nonstructural controls and operation and maintenance procedures. BMPs can be applied before, during and after pollution-producing activities to reduce or eliminate the introduction of pollutants into receiving waters.

40 C.F.R. § 130.2(m) (1992).

57. *See* MEMORANDUM OF AGREEMENT BETWEEN THE ARKANSAS SOIL AND WATER CONSERVATION COMMISSION AND THE ARKANSAS DEPARTMENT OF POLLUTION CONTROL AND ECOLOGY (dated Feb. 22, 1990) (memorandum apportions authority for implementing the section 1329 program).

58. ARKANSAS DEP'T OF POLLUTION CONTROL & ECOLOGY, ARKANSAS NONPOINT SOURCE POLLUTION ASSESSMENT REPORT "UPDATE" *passim* (1991).

significant confined animal populations should be considered threatened.[59]

The ASWCC is responsible for preparing and implementing the agricultural components of the section 319 nonpoint pollution control program, including the development of BMPs for poultry and livestock operations. The ASWCC also administers section 319 federal grants awarded to Arkansas for the assessment of water quality problems and the development of agricultural nonpoint source pollution control measures. This federal grant money is provided on a matching funds basis under which states must provide forty percent of the funds, and the federal government provides the remaining sixty percent. The federal government has granted between $450,000 and $900,000 per year to Arkansas since this program has been funded. The ASWCC has used these funds for monitoring water quality in selected watersheds, demonstrating on-farm pollution control programs, providing technical assistance programs, and other training programs for water quality technicians and farmers.[60] Parallelling this ASWCC voluntary program of BMPs and technical assistance, the Arkansas DPC&E has implemented mandatory regulations for handling liquid animal waste.[61]

Congress is currently considering the reauthorization of the Clean Water Act, and nonpoint source agricultural pollution is a major issue in this debate.[62] Nonpoint source pollution, including the potential for groundwater contami-

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59. *Id.* at 91.

60. *See* ARKANSAS SOIL AND WATER CONSERVATION COMMISSION, NONPOINT SOURCE MANAGEMENT STATUS REPORT NO. 9, at 2-5 (1992).

61. *See infra* text accompanying notes 89-103 for a discussion of DPC&E Reg. No. 5.

62. *See, e.g.*, Senate Bill 1114, the Water Pollution Prevention and Control Act of 1993. S. 1114, 103d Cong., 1st Sess. (1993). The June 17, 1993 version of the Bill revises section 319 of the Clean Water Act by requiring that states develop water pollution prevention plans that provide for the necessary legal authority to ensure the implementation of management measures for existing and new nonpoint pollution sources. At a minimum, the required legal authority shall include the authority to seek injunctive relief for the failure to implement management measures. *Id.* § 304(a)(1)(C). The Bill also requires that the EPA Administrator, in consultation with the Secretary of Agriculture, publish guidelines for the design of animal waste management facilities. Animal waste management facilities are defined as facilities for the storage, treatment, or disposal of animal waste. *Id.* § 304(e). *See also Water*

nation, is not easily addressed by the means which are employed for controlling pollutants from point sources. Permitting schemes are of little value where pollution is diffuse. Furthermore, it is difficult or impossible to fine-tune control the amount of pollutants in effluent or runoff since effluent charges may be impractical when applied to nonpoint pollution.[63] The imposition of charges or penalties is equally difficult because of problems in identifying specific sources of pollutants.[64]

Given the nature of nonpoint source pollution, solutions must be based upon restricting the activities which create the problem rather than on after the fact measurement and enforcement. These restrictions can be placed into two general categories. The first category is restrictions on the siting of agricultural operations. These controls go to the heart of land use which Congress has traditionally left to state and local governments. Congressional action which would mandate local land use designations is a very sensitive political issue.[65]

The second category is restrictions on farming activities and practices, i.e., the development of BMPs. Congress has enacted some mandatory BMPs and is currently considering others. For example, the conservation compliance provisions of recent federal farm bills mandate that farmers develop and apply a plan of BMPs to prevent soil erosion in order to remain eligible for a variety of support and benefit programs.[66]

Pollution: Need for Non-Point Controls Stressed in Reauthorization of Clean Water Act, 24 Env't Rep. (BNA) 513 (1993).

63. Such suggestions have been proposed. *See* Jurgens, *Agricultural Non-Point Source Pollution: A Proposed Strategy to Regulate Adverse Impacts*, 2 J. LAND USE & ENVTL. L. 195 (1986); Lawrence Ng, Note, *A DRASTIC Approach to Controlling Groundwater Pollution*, 98 YALE L.J. 773 (1989).

64. Debbie Sivas, *Groundwater Pollution From Agricultural Activities: Policies for Protection*, 7 STAN. ENVTL. L.J. 117, 159 (1986-88).

65. *See* GAO, WATER POLLUTION: GREATER EPA LEADERSHIP NEED TO REDUCE NONPOINT SOURCE POLLUTION at 32-4 (1990).

66. 16 U.S.C. § 3801 (1988 & Supp. IV 1992).

B. Coastal Zone Act Reauthorization Amendments Of 1990

Although Congress is still debating how to deal with nonpoint source agricultural pollution in the reauthorization of the Clean Water Act, an indication of the direction which Congress may take is provided by section 6217 of the Coastal Zone Act Reauthorization Amendments of 1990.[67]

The Coastal Zone Management Act of 1972[68] provides for the development of coastal zone management programs for the protection of estuarine and coastal waters. Twenty-nine states have established coastal zone management programs. The National Oceanic and Atmospheric Administration (NOAA) is empowered to review and approve state programs.[69] After a state program receives approval, the state is eligible for federal funds to administer the program.[70] In addition, federal agencies must ensure that federal activities are consistent with the states' coastal management plans.[71]

In 1990, Congress enacted the Coastal Zone Act Reauthorization Amendments (CZARA) which require each state with an approved coastal zone management program to develop a Coastal Nonpoint Pollution Control Program.[72] Although Arkansas is not a coastal state, the coastal nonpoint pollution control program is significant to Arkansas animal agricultural producers for two reasons: (1) the program apparently requires the mandatory regulation of animal agricultural nonpoint pollution; and (2) Congress may use the coastal nonpoint pollution control programs as the model for revising the Clean Water Act nonpoint pollution provisions which affect all states.

The CZARA require the EPA to develop and publish guidelines for the states which specify measures for manag-

67. 16 U.S.C. § 1455(b) (1988 & Supp. IV 1992).

68. 16 U.S.C. § 1451 (1988 & Supp. IV 1992).

69. 16 U.S.C. § 1455(d) (1988 & Supp. IV 1992). The Secretary of the Department of Commerce has delegated administration of the Coastal Zone Management Act to the NOAA, an agency within the Department.

70. 16 U.S.C. § 1455(a) (Supp. IV 1992).

71. 16 U.S.C. § 1456(c) (Supp. IV 1992).

72. 16 U.S.C. § 1455b (Supp. IV 1992).

ing nonpoint source pollution.[73] The EPA released its final version of the management measures in January 1993.[74] The final version addresses sources of pollution relevant to animal agriculture including measures for confined animal facilities, nutrient management, and grazing management.[75] States with coastal zone management programs have until July 1995 to submit their coastal nonpoint pollution control programs to the EPA and NOAA and until January 1999 to fully implement their programs. These programs must contain nonpoint pollution control measures which are in conformity with the EPA's guidelines on management measures.[76]

Under the CZARA, states are to implement their coastal nonpoint pollution control programs through modification of their coastal zone management programs.[77] Section 306(d)(16) of the Coastal Zone Management Act prohibits the NOAA from approving modifications of a state's coastal zone management program unless the modification contains enforceable policies and mechanisms to implement statutory requirements.[78] The Act defines an "enforceable policy" as legally binding measures by which a state exerts control over private and public land and water uses and natural resources in the coastal zone.[79] Under the CZARA statutory requirements, states must maintain a continuing program for the identification of land uses which cause or contribute to degradation of coastal waters. Degradation occurs when the waters fail to meet the state's water quality standards or where designated uses of the waters are not supported. States are also required to maintain a continuing process for identifying critical coastal areas ad-

73. 16 U.S.C. § 1455b(g) (Supp. IV 1992).

74. OFFICE OF WATER, U.S. ENVIROMENTAL PROTECTION AGENCY, GUIDANCE SPECIFYING MANAGEMENT MEASURES FOR SOURCES OF NONPOINT POLLUTION IN COASTAL WATERS (1993).

75. *Id.* at 2-33 to -60, 2-73 to -85.

76. 16 U.S.C. § 1455b(b) (Supp. IV 1992).

77. 16 U.S.C. § 1455b(c)(2) (Supp. IV 1992).

78. 16 U.S.C. § 1455(d)(16) (Supp. IV 1992).

79. The definition provides that enforceable policies may include policies "legally binding through constitutional provisions, laws, regulations, land use plans, ordinances[,] or judicial or administrative decisions." 16 U.S.C. § 1453(6)(a) (Supp. IV 1992).

jacent to degraded coastal waters, in which new land uses or significant expansion of existing uses are subject to management measures. The states are further required to implement and continually revise management measures applicable to identified land uses and critical areas that are necessary to achieve and maintain applicable water quality standards and to protect designated uses.

In the guidance on development and approval of coastal nonpoint pollution control programs, the EPA and NOAA have interpreted the statutory provisions to indicate that, at a minimum, states must adopt enforceable, legally binding policies and mechanisms to ensure that guidance management measures will be implemented. These policies and mechanisms may include state and local regulatory controls or non-regulatory incentive programs in conjunction with state enforcement authority.[80]

Congress also intended that the coastal nonpoint pollution control programs serve as updates and expansions of the coastal states' Clean Water Act section 319 programs.[81] The incorporation of coastal nonpoint pollution control programs into the section 319 programs will result in enforceable section 319 programs for the coastal states.

As evidenced by the CZARA and by various estuarine protection programs established under the Clean Water Act,[82] Congress is especially protective of coastal waters. Congress, however, has not extended the same degree of protection to inland waters. The degree of success of the CZARA nonpoint pollution programs may determine whether Congress incorporates their provisions, including mandatory regulatory controls, into the Clean Water Act's nonpoint pollution control measures for all states.[83]

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80. U.S. DEP'T COMMERCE, NOAA & USEPA, COASTAL NONPOINT POLLUTION CONTROL PROGRAM: PROGRAM DEVELOPMENT AND APPROVAL GUIDANCE Executive Summary vii-viii (1993).

81. 16 U.S.C. § 1455b(a)(2) (Supp. IV 1992).

82. *See, e.g.*, 33 U.S.C. § 1267 (1988) (continuing the Chesapeake Bay Program).

83. Senate Bill 1081 did provide that a nonpoint pollution program consistent with the Coastal Nonpoint Pollution Control Program requirements be incorporated into the Clean Water Act. The Bill also provided that program implementation criteria include " . . . State statutes, county or municipal ordinances, financial assistance

C. Safe Drinking Water Act

Under the Safe Drinking Water Act,[84] the EPA promulgates National Primary Drinking Water Standards for public drinking water systems drawn from both surface and groundwater sources.[85] These standards consist of maximum contaminant levels for substances listed under the Act, treatment techniques, and requirements for monitoring, reporting, and public notification.[86] The states are the primary enforcers of these standards.[87] In Arkansas, the state Department of Health has the primary responsibility for implementing Safe Drinking Water Act standards.[88]

The predominant drinking water contaminants generated by animal production operations are nitrates and pathogenic microorganism.[89] If the Safe Drinking Water Act standards for these contaminants are exceeded, then the public drinking water supply must be treated, sometimes at great expense, to deal with the problem. Arkansas agencies are also concerned with contamination of private rural wells, which are not directly subject to the federal standards. Treating private well water or finding alternative supplies can be costly and impractical, especially for rural residents.

The Safe Drinking Water Act does not authorize lawsuits directly against polluters of public drinking water supplies. The Act, however, does provide for enforcement

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programs, and related enforceable authorities." S. 1081, 102d Cong., 1st Sess. § 15(a)(6) (1991).

84. 42 U.S.C.A. §§ 300f-300j-11 (West 1991).

85. The Safe Drinking Water Act defines a public water system as a system for the provision of piped water for human consumption, if such a system has at least fifteen service connections or regularly serves at least twenty-five individuals. 42 U.S.C.A. § 300(f)(4) (West 1991).

86. 42 U.S.C. § 300g-1 (1988).

87. 42 U.S.C. § 300g-2 (1988).

88. ARK. CODE ANN. § 20-28-102 (Michie 1987).

89. *See* SOIL CONSERVATION SERVICE, U.S. DEP'T AGRIC., WATER QUALITY INDICATORS GUIDE: SURFACE WATERS at 33-4 (1989); *See also* National Primary Drinking Water Regulations-Synthetic Organic Chemicals and Inorganic Chemicals, 40 C.F.R. § 141-143 (1992) (discussing the drinking water regulations for nitrates); National Primary Drinking Water Regulations, 40 C.F.R. §§ 141,142 (1992) (discussing the drinking water regulations for pathogenic microorganisms).

actions against the supplier of the public drinking water. The need for safe drinking water may eventually require direct regulation of agricultural activities under other statutes whose ultimate goal is the protection of drinking water supplies. For example, in 1986, Nebraska enacted the Groundwater Management and Protection Act[90] to deal with high nitrate levels in groundwater which were perceived as a public health threat. The nitrates were leaching into groundwater from fertilizers applied to irrigated crops. The Nebraska law empowers local natural resource districts to prepare management plans to curtail the pollution. These plans are then implemented through irrigation and fertilization schedules and restrictions.

D. Federal Wildlife Protection Law and Dead Bird Disposal

The federal government protects wildlife under three major statutes: the Endangered Species Act,[91] the Bald and Golden Eagle Protection Act,[92] and the Migratory Bird Treaty Act.[93] The two greatest threats to wildlife from agricultural activities are loss of habitat and pesticide poisonings.[94] Animal waste disposal creates fewer direct threats to wildlife than crop production systems. However, the recent poisoning of birds attributed to botulin toxin found in an illegal poultry dump has drawn the attention of federal wildlife officials to animal production in Arkansas. To date, federal officials have limited their role to investigative and educational activities.

III. ARKANSAS REGULATION OF ANIMAL AGRICULTURAL WASTES

The Arkansas state government is concerned about environmental problems arising from the rapid expansion of animal production in Arkansas. Specific areas of concern

90. NEB. REV. STAT. §§ 46-656 to -674.20 (1988).
91. 16 U.S.C. § 1531 (1988 & Supp. IV 1992).
92. 16 U.S.C. § 668 (1988 & Supp. IV 1992).
93. 16 U.S.C. § 703 (1988 & Supp. IV 1992).
94. *See* Martha L. Noble, *Current Environmental Topics: Pesticide Use and Federal Protection of Wildlife*, 12 J. AGRIC. TAX'N. & L. 160 (1990).

include management of liquid animal waste, management of dry poultry litter, and requirements for disposal of dead animals, particularly poultry.

A. Regulation of Liquid Animal Waste Management Systems

In 1992, the Arkansas Pollution Control and Ecology Commission promulgated Regulation No. 5 governing the management of liquid animal waste systems.[95] Prior to 1992, the DPC&E had issued permits for confined animal operations that generated liquid animal waste based on general pollution control authority granted to the agency by the Arkansas Water and Air Pollution Control Act.[96] In May of 1990, then Governor Bill Clinton appointed the Animal Waste Task Force to examine animal waste pollution and help develop an animal waste management plan for Arkansas.

The Pollution Control & Ecology Commission, in the summer of 1990, ordered a temporary moratorium on the issuance of hog farm permits in response to protests from residents of Polk and Sevier Counties.[97] The residents were concerned over water quality, odor, and other problems associated with large-scale hog operations. The Commission eventually lifted this moratorium, but it appointed its own task force to look at animal waste issues.[98] The Commission task force became a subcommittee of the Governor's

95. ARKANSAS DEP'T OF POLLUTION CONTROL & ECOLOGY, REG. NO. 5: LIQUID ANIMAL WASTE MANAGEMENT SYSTEMS (1992).

96. The general authority of the Arkansas Water and Air Pollution Control Act makes it unlawful for any person to pollute any water of the state or to place wastes in a location where it is likely that water pollution will result. ARK. CODE ANN. § 8-4-217 (Michie 1987). The DPC&E also administers the NPDES program, which includes a permit requirement for large concentrated animal feeding operations discharging directly into the waters of the United States. Most of the confined animal operations in Arkansas are operated so that animal waste is land applied rather than discharged directly into water bodies. The DPC&E does not consider that such operations require a NPDES permit. For a discussion of whether concentrated animal feeding operations which handle waste on a "no discharge" basis are exempt from NPDES permit requirements, *see supra* text accompanying notes 34-38.

97. Hal Brown, *Ruling Chills Hog Farmers*, ARK. DEMOCRAT, Aug. 1, 1990, at 1D, 8D.

98. Ward Pincus, *Panel Lifts 30-Day Ban on Hog Farm Permits*, ARK. DEMOCRAT, August 25, 1990, at 1D, 3D.

Animal Waste Task Force and coordinated the development of Regulation No. 5.[99]

Regulation No. 5 prohibits the construction or operation of confined animal waste facilities that use liquid waste handling systems without a permit. This regulation primarily affects confinement hog facilities, breeding hen operations, and dairies.[100] A confined animal operation is defined as "any lot or facility where livestock or fowl have been, are[,] or will be stabled or confined and fed or maintained and where crops, vegetation, forage growth[,] or post-harvest residues are not sustained in the normal growing season over significant portions of the lot or facility."[101] A liquid animal waste management system is defined as "any system used for the collection, storage, distribution[,] or disposal of animal waste in liquid form generated by a confined animal operation."[102] Note that Regulation No. 5 covers all confined animal operations, whereas the federal minimum requirements of the NPDES program only cover relatively large, concentrated, animal feeding operations.[103]

In addition, Regulation No. 5 expressly extends to land application of liquid animal waste.[104] Permit applicants must submit a management plan for storage and handling of animal waste at the confinement facility and a site management plan for each land application site. The site management plan must be prepared by an Arkansas registered professional engineer, the USDA Soil Conservation Service, or a water quality technician of the Arkansas Soil and Water Conservation Commission.

Prior to submitting an application for a permit, or for modification of a permit previously issued under Regulation No. 5, the applicant must give public notice of the ap-

99. Cary Bradburn, *Two Waste Groups Talk Hogs*, ARK. GAZETTE, Sept. 22, 1990, at 9B. The Commission was also concerned about the DPC&E administering a permit program in the absence of implementing regulations.

100. Permittees with permits issued before the effective date of Reg. No. 5, who have not submitted waste management and land application site plans, are given one year from the regulation's effective date to submit the plans.

101. Reg. No. 5, § 4.

102. *Id.*

103. *See supra* note 31.

104. Reg. No. 5, § 6.

plication and of an opportunity for a DPC&E hearing on the application in the event DPC&E deems that a public hearing is necessary or desirable. In addition, permit applicants and managers or operators of the proposed operation must provide certification of satisfactory completion of formal education or training in the areas of waste management and odor control. The University of Arkansas Cooperative Extension Service has developed a training and certification program to meet this requirement.

Regulation No. 5 includes a number of technical requirements for liquid animal waste management systems, including setbacks from neighboring properties,[105] which serve primarily to diminish odors. Most agricultural air pollution, however, is exempt from the Arkansas Water and Air Pollution Control Act.[106] Therefore, DPC&E cannot deal squarely with odor in a regulation. The only direct reference to odor in Regulation No. 5 is the suggestion that permittees adopt good neighbor policies and consider the use of chemical or biological additives or other odor BMPs.[107]

Land application of animal waste or wastewater is prohibited under Regulation No. 5 when soil is saturated, frozen, covered with ice or snow, or when significant precipitation is expected within twenty-four hours. Waste and wastewater cannot be applied on slopes greater than fifteen degrees or in a manner which would allow waste-

105. Confinement buildings, settling basins, holding ponds, and other waste containment structures for confined animal operations in excess of the following numbers of animals: 600 beef cattle, 430 dairy cows, 1500 finishing hogs, 600 sows, 33,000 turkeys, or 130,000 chickens, shall not be constructed within 1,320 feet of the nearest existing occupied dwelling. All other such facilities shall have a buffer distance of 500 feet. The buffer distances shall not apply if the dwelling is owned by the owners or operators of the liquid animal waste management system or if the adjoining property owner consents in writing. Reg. No. 5, § 6.

106. The Water and Air Pollution Control Act exempts from the Act's requirements agricultural operations in the growing or harvesting of crops and the raising of fowl or animals and use of equipment in such agricultural operations. ARK. CODE ANN. § 8-4-305 (Michie 1987). Moreover, odor in general is not regulated under the Act. In addition, the Act preempts local regulation of the control and abatement of air pollution and contamination, except for local regulation of open burning or burning in a receptacle having no means for significantly controlling the fuel/air ratio. ARK. CODE ANN. § 8-4-306 (Michie 1987).

107. Reg. No. 5, § 2.

waters to enter the water systems of the state or run onto adjacent land without the property owner's consent. There are also setback requirements for waste or wastewater application.[108]

Land application records must be kept, and a sample of the waste or wastewater must be tested for specified substances on an annual basis. The soils where applications occur must be tested in the spring for substances of concern.[109] The DPC&E may issue separate permits for land application if the owner of the land submits an application which includes site management and waste management plans for the site. Applications for land application sites must be accompanied by proof of ownership or a contractual agreement for the use of the land for application.[110]

Decisions to grant or deny Regulation No. 5 permits may be appealed in accordance with DPC&E's administrative regulations. Some recent Pollution Control & Ecology Commission decisions permitting hog farms are currently being challenged.[111]

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108. *Id.* § 6. Application of waste or wastewater shall not be made within 100 feet of streams including intermittent streams, ponds, lakes, springs, sinkholes, outcrops, wells and water supplies or within 300 feet of extraordinary resource waters as defined by DPC&E Reg. No. 2. DPC&E may also require additional buffers designed to protect the waters of the state. Application of waste or wastewater shall not be made within 50 feet of property lines or within 500 feet of neighboring occupied buildings existing as of the date of the permit, unless the adjoining property is also approved as a land application site by the DPC&E or the adjoining property owner consents. *Id.*

109. *Id.*

110. *Id.*

111. DPC&E's administrative procedures are found in DPC&E Reg. No. 8. Note that in its 1993 Regular Session, the Arkansas General Assembly amended the general administrative procedures for the Water and Air Pollution Control Act. Senate Bill 22 and House Bill 1062, approved as Acts 163 and 165 of 1993. Section 13 of the Act, amending ARK. CODE ANN. § 8-4-203 (Michie 1987), provides that notice of proposed denial or granting of permits will be published to afford interested parties an opportunity to submit comments. Only those persons who submit comments on the record during this period shall have standing to appeal the decision of the department to the commission. Section 8-4-205 was also amended by providing that the permit applicant and those who submitted comments on the record may appeal to the Pollution Control and Ecology Commission within 30 days after service of notice of the department's decision on a permit action. The issues raised on appeal by an interested party, other than the applicant, are limited to those raised during the public comment period unless the party can show good cause as to why such issue could not, with reasonable diligence, have been discovered and presented

B. Developing BMPs for Dry Poultry Litter

The Governor's Animal Waste Task Force has also considered environmental problems arising from land application of dry poultry litter. The Task Force recommended that dry poultry litter problems be addressed through a voluntary BMPs program rather than regulatory mandates.[112] In 1990, the Cooperative Committee for Poultry Farm Litter and Waste Disposal, comprised of representatives from the Arkansas Soil & Water Conservation Commission, the Arkansas Extension Service, the Arkansas DPC&E, the federal Soil Conservation Service, and the Arkansas Poultry Federation, developed a set of Dry Poultry Litter Handling Best Management Guidelines.[113] BMPs also are being developed as part of the Arkansas Nonpoint Source Pollution Management Plan required by Clean Water Act section 319.[114]

In Arkansas, the effect of EPA Region VI's NPDES general permit program for concentrated animal feeding operations on broiler production is uncertain. This new federal permit appears to establish mandates for handling, storage, and land application of broiler poultry litter by large broiler operations.[115]

C. Regulation of Dead Animal Disposal

Disposal of poultry which has died during the grow-out phase of production has garnered recent attention. In response, state officials have taken two actions: (1) statutory

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during the public comment period. The Act shortens the process in cases where there is a request for transfer of a permit. Notice must be given of the proposed transfer, and a disclosure statement as required by the "bad actor" provisions must be submitted. Unless the director objects to the transfer on "bad actor" grounds within 30 days, the permit is automatically transferred to the new permittee.

112. *Executive Summary of the Governor's Task Force on Animal Waste* (submitted to the Governor on Jan. 12, 1993, by the Director of the Ark. Soil & Water Conservation Comm'n), *reprinted in* ARK. NONPOINT SOURCE MGMT. STATUS REP. NO. 10 2 (1992).

113. *Dry Poultry Litter Handling Best Management Guidelines*, Recommendation of the Cooperative Committee for Poultry Farm Litter and Waste Disposal.

114. In addition, many broiler growers in northwestern Arkansas are receiving technical and cost-sharing assistance in implementing BMPs as part of Section 319 grant programs administered by the Ark. Soil & Water Conservation Comm'n.

115. *See supra* text accompanying notes 34-47.

amendments limiting the methods of dead animal disposal, and (2) enforcement actions against illegal open dumping of dead poultry.

The Arkansas Livestock and Poultry Commission has the primary authority for regulating the disposal of fowl carcasses.[116] Recent studies of dead fowl burial pits in Arkansas have shown that these pits may be a significant source of surface and groundwater pollution. The pits were intended to act similarly to human waste septic systems, with the waste decomposing into less harmful elements and the surrounding soil acting as a filtration system. Instead, many pits are not working properly, and groundwater running through the pits carries nitrates, ammonia, and disease organisms into both surface and groundwater.[117]

In response to these studies, the General Assembly adopted Act 241 in 1993, which eliminates disposal pits as a method which the Livestock and Poultry Commission may allow for routine disposal of dead poultry.[118] The Commission is allowed to consider pit disposal only in the event of a major die-off. Act 241 also added composting, extrusion, on-farm freezing, rendering, and cooking for swine feed to the list of acceptable methods for disposal which also includes cremation and incineration.[119] The 1993 General Assembly also adopted Act 522, which authorizes the Livestock and Poultry Commission to regulate the disposal of large animals which die from causes other than intentional slaughter. Animals covered by Act 522 include cattle, horses, hogs, sheep, goats, cervidae, bison, llamas, alpacas, ostriches, emus, rheas, and other native and nonnative animals, except dogs and cats.[120]

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116. ARK. CODE ANN. §§ 2-40-401 to -405 (Michie 1987). The DPC&E also has general authority to regulate disposal of dead animals. *See* Ark. Solid Waste Management Code, app. A, § VI.

117. ARKANSAS SOIL & WATER CONSERVATION COMM'N & ARK. WATER RESOURCES CTR., WATER QUALITY AND POULTRY DISPOSAL PITS (Fact Sheet No. 2, n.d.).

118. 1993 Ark. Acts 241.

119. *Id.* at § 2 (amending ARK. CODE ANN. § 2-40-403 (Michie 1987)). The Livestock and Poultry Commission is in the process of amending its regulations to conform with Act 241. For regulations prior to Act 241, *see* Regulations for Acceptable Methods of Poultry Carcass Disposal, 13 Ark. Reg. 30 (Mar. 1990).

120. 1993 Ark. Acts 522.

The Livestock and Poultry Commission has also stepped up enforcement against open dumping of dead poultry. Violation of the poultry disposal statute is a misdemeanor. In late 1992, five northwest Arkansas farmers were fined up to $1000 for illegally dumping dead chickens on their farms.[121] In addition, some poultry firms which contract with growers to grow out the birds have begun to require growers to implement dead chicken composting or incineration. Tyson Foods, Inc., a major Arkansas poultry processor, began a program to provide some growers with on-farm freezers. Frozen birds are held on these farms until Tyson trucks can transport the birds to a pet food processing plant.[122]

IV. ARKANSAS COMMON LAW REMEDIES & THE RIGHT-TO-FARM ACT

Animal production facilities and animal waste may produce odors and other air pollutants, generate water pollution, or attract flies and other pests. As a result, agricultural operations may interfere with the interests of adjacent landowners in the use and enjoyment of their property or with the interests of local government in ensuring the public health, safety, and welfare. Private lawsuits against animal production operations can proliferate as suburbs or retirement communities move into traditionally agricultural areas. Changes in surrounding land use bring animal producers into increasing conflict with their new neighbors. Lawsuits against livestock operations may also arise when large-scale operations are located in rural communities with a tradition of small-scale operations.[123]

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121. *See Disposal of Dead Birds a Lively Issue for Arkansas Growers*, POULTRY GROWERS NEWS No. 13, at 10 (Apr. 1993).

122. D.R. Stewart, *Firm Orders Dead Birds Composted*, ARK. DEMOCRAT-GAZETTE, Dec. 22, 1992, at D1, D6. For an examination of the relation between livestock and poultry growers and processors, *see infra* Section V.

123. *See, e.g.*, Michael v. Michael, 461 N.W.2d 334 (Iowa 1990) (neighboring manure spreading operation found to constitute a nuisance); Botsch v. Leigh Land Co., 236 N.W.2d 815 (Neb. 1975), *opinion withdrawn*, 239 N.W.2d 481 (1976) (small livestock farm operator sued large feedlot alleging nuisance); *see also* Syed A. Bokhari, *Some Environmental Complaints Are About Nuisances*, FEEDSTUFFS, Nov. 30, 1990, at 13 (report on farm neighbors' complaints about neighboring poultry operations).

In response to a perceived proliferation of lawsuits against agricultural operations, most state legislatures, including the Arkansas General Assembly, have adopted Right-to-Farm statutes. These laws give limited protection to agricultural operations by providing a defense to lawsuits or by limiting the powers of local governments to regulate the location and conduct of agricultural operations.

A. Common Law Remedies and Animal Agriculture

In general, nuisance has proven to be the most successful common law tort remedy in actions against agricultural operators. A successful plaintiff may recover monetary damages for the loss in property value caused by the offending activity or obtain an injunction prohibiting the continuation of the activity. The legal standard of negligence may be sufficient if the agricultural operator is not managing production facilities or animal waste properly. The common law doctrines of strict liability and trespass have also been used, although with limited success. In addition, some courts have recognized that water pollution activities constitute an interference with the riparian rights of others.

1. Nuisance

The most widely used common law tort doctrine for pollution abatement and redress is nuisance.[124] Although a precise definition of nuisance is difficult to formulate, a nuisance generally is an *unreasonable* interference with the use and enjoyment of another's property. The Arkansas Court of Appeals has described nuisance as

> . . . conduct by one landowner which unreasonably or unlawfully interferes with the use and enjoyment of the lands of another and includes conduct on property which disturbs the peaceful, quiet, and undisturbed use and enjoyment of nearby property. Equity will enjoin the conduct which culminates in a private or public nuisance where the resulting injury to the nearby property

124. For a comprehensive review of the state of nuisance law, *see*, Neil D. Hamilton & David Bolte, *Nuisance Law and Livestock Production in the United States: A Fifty-State Analysis*, 10 J. AGRIC. TAX'N & L. 99 (1988); *see also* Jeff L. Lewis, *Comparative Nuisance*, 50 U. PITT. L. REV. 1009 (1989).

> and residents, or to the public, is certain, substantial, and beyond speculation and conjecture. [citations omitted].[125]

Determining "reasonableness" requires using a balancing process which weighs the gravity of the harm against the utility of the conduct causing the harm.[126] Arkansas courts have been concerned particularly with ascertaining the degree of the harm to the plaintiff. Loss of health, loss of trade, destruction or "ruin" of property, and deprivation of use and enjoyment to a "material and substantive" extent are among the considerations used in determining whether the injury alleged is substantial, tangible, and a material discomfort and inconvenience.[127] Arkansas courts have also been reluctant to find a prospective nuisance which requires a finding of certainty.[128] A bare assertion of depreciation in property values is not enough, especially where the decline in value cannot be shown with certainty.[129]

Arkansas courts have avoided permanently enjoining "lawful and useful" businesses unless the necessity for doing so is "strong, clear and urgent".[130] If proper proof is presented, however, an injunction may issue.[131] In Arkansas, mere diminution in value, without proof of nuisance *in fact*, does not furnish a basis for equitable relief.[132]

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125. Miller v. Jasinski, 17 Ark. App. 131, 705 S.W.2d 442, 443 (1986).

126. The Restatement of Torts includes the following factors to be considered in the balancing process: the extent of the harm involved; the character of the harm involved; the social value which the law attaches to the type of use or enjoyment invaded; the suitability of the particular use or enjoyment invaded to the character of the locality; and the burden on the person harmed of avoiding the harm. RESTATEMENT (SECOND) OF TORTS § 827 (1979). The utility of the defendant's conduct is also a consideration in balancing the equities. The Restatement suggests that the following factors are relevant: the social value which the law attaches to the primary purpose of the conduct; the suitability of the conduct to the character of the locality; and the impracticability of preventing or avoiding the invasion. *Id.* § 828.

127. Milligan v. General Oil Co., Inc., 293 Ark. 401, 738 S.W.2d 404 (1987).

128. Miniat v. McGinnis, 26 Ark. App. 157, 762 S.W.2d 390 (1988).

129. City of Newport v. Emery, 262 Ark. 591, 559 S.W.2d 707 (1977).

130. Thiel v. Cernin, 224 Ark. 854, 276 S.W.2d 677 (1955).

131. Manitowoc Remanufacturing Inc. v. Vocque, 307 Ark. 271, 819 S.W.2d 275 (1991).

132. Milligan v. General Oil Co., Inc., 293 Ark. 401, 738 S.W.2d 404 (1987); Miller v. Jasinski, 17 Ark. App. 131, 705 S.W.2d 442 (1986).

The most common remedy in cases of "permanent" nuisance is money damages for actual losses suffered due to the continuing presence of a nuisance condition. These losses will include the loss in property value suffered because of the nuisance, as well as any past interference from the neighboring property. If the nuisance is permanent in nature, but its continuance may or may not result in injury, damages will be granted only for injury which has already occurred. Successive recoveries may, of course, be necessary in such a case.[133] Courts may impose punitive damages in particularly egregious cases, where the defendant has acted with a careless or reckless disregard of the rights of neighboring property owners.[134]

Nuisance lawsuits may include allegations of public or private nuisance, or both theories. The Arkansas Supreme Court has indicated that the distinction between public and private nuisance is determined by the extent of injury.[135] A public nuisance is an unreasonable interference with the interests of the general public or the community at large. The Restatement of Torts suggests a balancing test in this instance, comparing the interest of the defendant and the public at large rather than the narrower interest of single private plaintiffs.[136]

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133. Consolidated Chem. Indus., Inc. v. White, 227 Ark. 177, 297 S.W.2d 101 (1957).

134. *See, e.g.*, Bower v. Hog Builders, Inc., 461 S.W.2d 784 (Mo. 1970) (court characterized the defendant's conduct as evidencing an intent to "substantially interfere with the plaintiffs peaceable enjoyment of their adjoining properties"). On the other hand, courts have been reluctant to impose punitive damages where the evidence shows that the defendant takes measures to eliminate the pollution. *See, e.g.*, Earl v. Clark, 219 N.W.2d 487 (Iowa 1974); Lacy Feed Co. v. Parrish, 517 S.W.2d 845 (Tex. Civ. App. 1975). In both cases, the court found no evidence of "wrongful or illegal conduct" or "willful disregard of plaintiff's rights," typically required for punitive damages.

135. Milligan v. General Oil Co., Inc., 293 Ark. 401, 738 S.W.2d 404 (1987); Miller v. Jasinski, 17 Ark. App. 131, 705 S.W.2d 442, 443 (1986) (stating that the distinction between private and public nuisance is simply the extent of the injury, *i.e.*, the number of the persons suffering the effects of the nuisance).

136. The Restatement Second of Torts § 821B offers the following factors for determining the existence of a public nuisance:

> whether the conduct involves a significant interference with the public health, the public safety, the public peace, the public comfort or the public convenience; whether the conduct is proscribed by statute, ordinance or administrative regulation, or whether the conduct is of a continuing nature

Some activities may be classified as both public and private nuisances. For example, in *Ozark Poultry Products, Inc. v. Garman*,[137] odors from a poultry rendering plant were severe enough to be considered a public nuisance. The defendant sought to block a private nuisance lawsuit brought by nearby homeowners on the grounds that the plaintiff's injuries were the same as the general public's injury. The Arkansas Supreme Court ruled that the similarity of public and private injury did not bar the private plaintiffs from seeking a remedy for their particular injuries.[138]

Arkansas courts have found that animal production facilities do not constitute nuisances *per se*; however, they may be operated in a manner as to constitute nuisances in fact.[139] As a result, plaintiffs have the burden of submitting proof of specific harms caused by an animal agricultural operation. This burden represents a substantial obstacle in Arkansas courts. For example, in *Faires v. Dupree*,[140] the court found that a "hog ranch" was operated in an unsanitary manner and may have been a nuisance, but the plaintiff submitted insufficient evidence to prove damages. In *Thiel v. Cernin*,[141] neighbors sought an injunction against a broiler house built thirty feet from the property line and some sixty feet from a guest house. The court struggled with the issue of locality and indicated that a livestock operation may be a nuisance in one locality but not in another. The court concluded that in any event, "substantial and essential" injury was required, and no such proof had been presented in this case. A similar unsuccessful result was reached in *Green v. Smith*;[142] however, the court did re-

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or has produced a permanent or long lasting effect, and, as the actor knows or has reason to know, has a significant effect upon the public right.

RESTATEMENT (SECOND) OF TORTS § 821B (1979).

137. 251 Ark. 389, 472 S.W.2d 714 (1971).

138. *Id. See also* Ballance v. Harrison, 1991 WL 110998 (Ark. Ct. App. June 19, 1991) (unpublished opinion finding a "salvage yard" to be both a public and private nuisance).

139. *See, e.g.*, Bryson v. Ellsworth, 211 Ark. 313, 200 S.W.2d 504 (Ark. 1947); *see also* Adelsberger v. Adineh-Kharat, 1991 WL 3965 (Ark. Ct. App. Jan 16, 1991) (unpublished opinion where court found a "hog pen" was a nuisance).

140. 210 Ark. 797, 197 S.W.2d 735 (1946).

141. 224 Ark. 854, 276 S.W.2d 677 (1955).

142. 231 Ark. 94, 328 S.W.2d 357 (1959).

mand the case for a determination of whether catching broilers at night was sufficient to constitute a nuisance. Recent efforts against hog operations have been no more successful.[143]

2. Negligence

The common law concept of negligence provides a basis for liability in situations where the defendant has failed to act reasonably under the circumstances, and this failure caused harm to another. For example, if a farmer collects animal waste in a lagoon, and due to a lack of attention the lagoon overflows and causes damage to a neighbor's property, a proper action might be negligence. Negligence liability is based on the idea that a duty was owed and that action or failure to act caused harm to another person or that person's property.[144] Negligence theory is the root of a substantial portion of modern tort law; however, it is rarely used in pollution cases because it requires a showing of failure to act reasonably.

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143. In a recent unreported case, a hog farm operator under contract with Tyson Foods, Inc., was sued by neighboring landowners who alleged that the hog farm constituted a nuisance. The plaintiffs complained of excessive odor, noise, and flies. Evidence introduced at trial included test results from a Barnaby Cheeny Scentometer, a device designed to detect and measure odor. The chancellor also visited the properties. The chancellor ruled that the level of odor, noise, and flies was not sufficient to constitute a nuisance, although the chancellor did note that the odor was strong in the vicinity of the hog house. An Arkansas court of appeals confirmed the chancellor's decision. McRae v. Bishop, 1991 WL 103029 (Ark. Ct. App. June 5, 1991).

In another unpublished decision, the court found evidence presented by the defendant that the operation was "well-run" and that he had sought and followed the advice of the Cooperative Extension Service, the Soil Conservation Service, and a feed dealer to be sufficient to support the lower court's decision that no nuisance existed. Comte v. O'Brien, No. CA85-496 (Ark. Ct. App. June 4, 1986).

In Higbee v. Starr, the plaintiff raised state law claims for nuisance, trespass, battery, and negligence alleging that pollutants from a neighboring hog operation had contaminated her water supply. The court ruled that the plaintiff had not met the burden of proving that any run-off from animal waste disposal facilities and land applications had actually reached her water supply. 598 F. Supp. 323 (E.D. Ark. 1984), *aff'd*, 782 F.2d 1048 (8th Cir. 1985).

144. *See generally* NEIL D. HAMILTON, A LIVESTOCK PRODUCER'S LEGAL GUIDE TO: NUISANCE, LAND USE CONTROL AND ENVIRONMENTAL LAW (1992) (an excellent overview of tort law and animal agricultural operations).

3. Trespass

Trespass, unlike negligence or nuisance doctrines, involves an element of intent. To show trespass, the injured property owner must prove a physical invasion of or interference with the actual possession of property. The critical factor is that this invasion or interference must have been intentional. If these elements are shown, there can be trespass without harm.

Trespass has been used in some pollution cases where there is an actual invasion of neighboring property. This invasion can be by articles such as dust, smoke, or waste particles moving from one property to another. For example, in a relatively recent case, a group of landowners sued the operators of a copper smelter in trespass for damages to their property caused by airborne particles emanating from the smelter.[145] Trespass, however, has not been invoked against animal agricultural enterprises in any reported Arkansas cases.

4. Strict Liability

Strict liability in pollution cases has rarely been used as a basis for recovery. In situations where the defendant's activity is considered abnormally dangerous, the plaintiff does not need to show fault if the court decides to follow the strict liability concept. For instance, a few states have applied the strict liability concept to aerial spraying of pesticides.[146]

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145. Bradley v. American Smelting and Ref. Co., 709 P.2d 782 (Wash. 1985) (the court limited the plaintiff's trespass action to damages which were actual and substantial and which were caused by the accumulation of the particles on the land).

146. *See, e.g.*, Gotreaux v. Gary, 94 So. 2d 293 (La. 1957); Young v. Darter, 363 P.2d 829 (Okla. 1961); Cross v. Harris, 370 P.2d 703 (Or. 1962); Langans v. Valicopters, Inc., 567 P.2d 218 (Wash. 1977).

The question of whether an activity is abnormally dangerous depends on a number of factors, summarized in the Restatement as follows:

a. existence of a high degree of risk of some harm to the person, land or chattels of others;
b. likelihood that the harm that results from it will be great;
c. inability to eliminate the risk by the exercise of reasonable care;
d. extent to which the activity is not a matter of common usage;
e. inappropriateness of the activity to the place where it is carried on; and

The Arkansas Supreme Court has been reluctant to embrace strict liability. When faced with a classic case involving a dam that broke causing flooding damage, the court suggested that negligence or *res ipsa loquitur* were more appropriate causes of action than strict liability.[147]

5. Riparian Rights

Under the riparian rights doctrine, landowners are entitled to make reasonable use of water from a bordering lake or watercourse. Downstream owners are entitled to receive water that is not unreasonably impaired in quality or quantity. This concept is similar to the underlying foundation in a nuisance action, but it is often asserted as a separate cause of action by downstream riparian owners.[148] In *Carson v. Hercules Powder Co.*,[149] a commercial fisherman was allowed to recover lost profits against a business which discharged industrial waste into a nonnavigable stream used by the fisherman under consent from the riparian owners.

In the agricultural context, however, damage from a particular source of pollution is difficult to prove. For example, riparian uses such as fishing may be impaired by increased nutrient loading in a stream resulting from land application of animal waste. However, many farmers may be applying the waste, and the pollutant of concern may also be found naturally in the stream. Assessing the degree of harm caused by each farmer's contribution to the nutrient load in the stream is a difficult technical undertaking.

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f. extent to which its value to the community is outweighed by its dangerous attributes.

RESTATEMENT (SECOND) OF TORTS § 520 (1979).

147. Dye v. Burdick, 262 Ark. 124, 553 S.W.2d 833 (1977).

148. *See, e.g.*, Borough of Westville v. Whitney Home Builders, 122 A.2d 233 (N.J. 1956). The court recognized the concept but refused to grant an injunction based on the "weighing of the reasonableness, under all the circumstances, of the use being made by the defendant and of the materiality of the harm, if any, found to be visited by such use upon the reasonable uses of the water by the complaining owner." The action in Westville is more nearly a nuisance action. The concept of a cause of action for interference with a riparian property right was specifically recognized in Springer v. Joseph Schlitz Brewing Co., 510 F.2d 468 (4th Cir. 1975).

149. 240 Ark. 887, 402 S.W.2d 640 (1966).

B. Arkansas Right-to-Farm Act

States have enacted statutory limitations, called Right-to-Farm Acts, on the circumstances under which nuisance actions may be brought against agricultural operations. These acts provide defenses to nuisance actions when specified conditions are met.[150] Under the Arkansas Right-to-Farm Act, agricultural facilities which have been in operation for one year or more may not become a public or private nuisance as a result of changed conditions in the locality, provided that the agricultural operations were not a nuisance at the time operations commenced.[151] In other words, the statute provides a strong "coming to the nuisance" defense for agricultural enterprises. In addition, the Act defines the term "agricultural facility" broadly to include processing and distribution facilities, as well as animal production facilities.[152]

This protection, however, is not absolute. A facility can lose the protection if the character of its operation changes or its physical plant materially increases in size.[153] Additionally, the Act does not affect or defeat the right of a person, firm, or corporation to recover damages sustained because of the pollution or change in the condition of the

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150. *See also* Jacqueline P. Hand, *Right to Farm: Breaking New Ground in the Preservation of Farmland*, 45 U. PITT. L. REV. 289 (1984); Margaret K. Grossman & Thomas G. Fischer, *Protecting the Right to Farm: Statutory Limits on Nuisance Actions Against the Farmer*, 1983 WIS. L. REV. 95; Randall W. Hanna, *"Right to Farm" Statutes - The Newest Tool in Agricultural Land Preservation*, 10 FLA. ST. U. L. REV. 415 (1982).

151. The Act reads:

> An agricultural facility, its appurtenances, or the operation thereof shall not be or become a nuisance, private or public, as a result of any changed conditions in and about the locality after it has been in operation for a period of one (1) year or more when the facility, its appurtenances, or the operation thereof was not a nuisance at the time the operation began.

ARK. CODE ANN. § 2-4-107 (Michie 1987).

152. The Act provides the following definition for purposes of defining agricultural operations as nuisances:

> . . . the term "agricultural facility" or "facility" means, but is not limited to, any plant, facility, structure, or establishment used for the feeding, growing, production, holding, processing, storage, or distribution for commercial purposes of crops, livestock, poultry, swine, or fish, or products derived from any of them.

ARK. CODE ANN. § 2-4-102 (Michie 1987).

153. ARK. CODE ANN. § 2-4-104 (Michie 1987).

waters of any stream or on account of any overflow of the lands of any person, firm, or corporation.[154]

No reported cases concerning the Arkansas Right-to-Farm Act exist. An examination of cases from other states, however, illuminates potential pitfalls in the right-to-farm defense. Because of the numerous technical requirements that must be met, farmers in other states have had limited success in using their state statutes as a defense to nuisance actions.[155] To date, the right-to-farm defense has been successfully applied in only three cases.[156]

On the other hand, the statutes have been raised in a few other cases but rejected as defenses to nuisance actions. For example, in a recent Indiana case the court held the statute did not apply to a situation where the plaintiffs lived next door to the defendant for six years prior to the defendant commencing a hog operation.[157] A similar result was reached in the first right-to-farm case, *Herrin v. Opatut*,[158] in which the Georgia Supreme Court found that the Georgia right-to-farm statute did not offer protection to a farmer

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154. ARK. CODE ANN. § 2-3-106 (Michie 1987).

155. The use of right-to-farm statutes has raised a number of legal issues, in part because of the uncertainty of the language often employed. Pertinent questions in examining a particular state's act including the following:

1. What agricultural practices are protected?
2. How long must the agricultural operation pre-date changes in the neighborhood?
3. Are changes in the use of surrounding land necessary?
4. What is the effect of expansion of the agricultural enterprise or changes in technology employed?
5. Is reasonable operation required?
6. Are all types of nuisance creating activities, such as water pollution or soil erosion, included?
7. What is the effect of local regulation?
8. What is the nature of the legal protection afforded?
9. Are generally accepted agricultural management practices required?
10. Are both private and public nuisances covered?
11. Are provisions for fee shifting included?

See NEIL D. HAMILTON, A LIVESTOCK PRODUCER'S GUIDE TO: NUISANCE, LAND USE CONTROL, AND ENVIRONMENTAL LAW (1992).

156. Laux v. Chopin Land Assoc., Inc., 550 N.E.2d 100 (Ind. Ct. App. 1990); Shatto v. McNulty, 509 N.E.2d 897 (Ind. Ct. App. 1987); and Northville Tp. v. Coyne, 429 N.W.2d 185 (Mich. Ct. App. 1988).

157. Wendt v. Kerkhof, 594 N.E.2d 795 (Ind. Ct. App. 1992). In this case the court actually held for the defendant because the trial court found that the hog operation was not a nuisance.

158. 281 S.E.2d 575 (Ga. 1981).

who built chicken houses on what had only been a small pasture area. The court interpreted the language of the Georgia statute, which provided that an agricultural facility would not become a nuisance "as a result of changed conditions in the locality of such facility," to apply only when nonagricultural land uses extended into existing agricultural areas. Similar results have been attained in the handful of right-to-farm cases heard in other courts.[159] Another remaining issue is whether the Arkansas Right-to-Farm Act precludes plaintiffs from bringing actions against agricultural enterprises under other tort theories, such as negligence or trespass.[160]

Farmers in Arkansas may have more success in relying on the Right-to-Farm Act. Each state has tailored its act in response to the nature of its agricultural production. For example, many states provide a more limited protection than that which is provided by the Arkansas Act. Some states list specific types of agricultural practices which are included in the right-to-farm protection or extend protection only to certain types of agricultural operations.[161]

In addition to limiting private lawsuits, the Arkansas Right-to-Farm Act nullifies municipal or county ordinances which provide for the abatement of agricultural enterprises protected under the Act or which make such enterprises

159. *See, e.g.*, Swedenberg v. Phillips, 562 So. 2d 170 (Ala. 1990); Pasco County v. Tampa Farm Serv., Inc., 573 So. 2d 909 (Fla. Dist. Ct. App. 1990); Carpenter v. Double R Cattle Co., Inc., 669 P.2d. 643 (Idaho Ct. App. 1983), *vacated*, 701 P.2d 222 (Idaho 1985); Day v. Warren, 524 So. 2d 1383 (La. Ct. App. 1988); Jerome Tp. v. Melchi, 457 N.W.2d 52 (Mich. Ct. App. 1990); Flansburh v. Coffey, 370 N.W.2d 127 (Neb. 1985); Cline v. Franklin Pork, Inc., 361 N.W.2d 566 (Neb. 1985); Mayes v. Tabor, 334 S.E.2d 489 (N.C. Ct. App. 1985); Weida v. Ferry, 493 A.2d 824 (R.I. 1985); Coty v. Ramsey Assocs., Inc., 546 A.2d 196 (Vt. 1988), *cert. denied*, 487 U.S. 1236 (1988); Benton City v. Adrian, 748 P.2d 679 (Wash. Ct. App. 1988).

160. For a discussion of this issue and other questions concerning application of the Arkansas Right-to-Farm Act, *see* Linda A. Malone, *Farmland Preservation*, 1985 ARK. L. NOTES 73.

161. For example, the Oklahoma legislation extends protection to livestock feedlots. OKLA. STAT. ANN. tit. 2, § 9-210 (West 1993). The Oklahoma legislation also limits protection to agricultural operations which are conducted in a manner consistent with good agricultural practices. These are presumed to be reasonable and do not constitute a nuisance if established before nonagricultural activities are established on surrounding land. OKLA. STAT. ANN. tit. 50, § 1.1 (West 1988).

nuisances.[162] Local land use control in Arkansas received legislative sanction years ago. The enabling legislation allows counties and cities to regulate the "uses of land" through zoning ordinances and through comprehensive planning.[163]

Until recently, Arkansas counties have had little interest in adopting land use regulations. The ability of a local government to use this authority to deal with environmental questions, however, was reaffirmed in *Johnson v. Sunray Services, Inc.*.[164] This Arkansas Supreme Court decision upheld a Washington County Quorum Court ordinance restricting the location of landfills within certain watersheds in the county. This decision prompted the 1993 Arkansas General Assembly to adopt Act 1280 which limits the ability of a county board to impose such restrictions directly, unless they are in conjunction with a county-wide comprehensive land use plan.[165] This action may encourage additional local government involvement in land use decisions, especially if counties wish to retain their role in matters such as landfill siting. Indeed, the Washington County Planning Board has announced that it is developing a zon-

162. ARK. CODE ANN. § 2-4-105 (Michie 1987). *See* Ark. Op. Att'y Gen. No. 87-120, 10 Ark. Reg. 458 (1987) (town ordinance prohibiting commercial swine or fowl production facilities within the town limits invalid if in conflict with Right-to-Farm law); Ark. Op. Att'y Gen. No. 87-297, 11 Ark. Reg. 502 (1988) (county ordinance designating locations where hog farms are allowed valid if applied so as not to violate the Right-to-Farm Act). Note that state government also has powers to declare nuisances. The State Board of Health or the Governor may require the investigation of a nuisance. Upon filing of a nuisance report certified by the Board of Health, the Governor is authorized to declare matters in the report to be a public nuisance and to order the matters changed, abated, or removed. If the Governor's order is violated, the Governor may order the prosecutorial officers of a county to execute the order. ARK. CODE ANN. § 20-7-113 (Michie 1987). With regard to agricultural facilities, the Arkansas Right to Farm law may be limited by the authority of the State Board of Health to act in the public interest. No actual conflict between these two statutes has been reported. *See* Ark. Op. Att'y Gen. No. 86-199 (1986).

163. ARK. CODE ANN. §§ 14-17-201 to -309 (Michie 1987 and Supp. 1993).

164. 306 Ark. 497, 816 S.W.2d 582 (1991).

165. Act 1280 also provides that local governments may, by resolution, request that Regional Solid Waste Management Boards adopt more stringent measures. 1993 Ark. Acts 1280 (to be codified at ARK. CODE ANN. § 8-6-209 (Michie 1991)).

ing plan which may include farmland protection measures in addition to landfill siting provisions.[166]

Circumstances giving rise to nuisance lawsuits can be prevented or alleviated through the use of zoning measures. These regulations separate incompatible uses or put landowners on notice as to which land uses may be permitted in the area. A similar approach, which utilizes comprehensive zoning, is to provide nuisance protection to agricultural operations located in designated agricultural districts. Special rules exist for the creation of agricultural districts, and to be completely protected, the agricultural operation usually must be in compliance with federal, state, and local law. Generally accepted agricultural management practices may also be required.[167]

Should local governments in Arkansas choose to play a more active role in decisions regarding the location of confined animal production facilities, similar efforts toward comprehensive land use planning will be necessary. This type of planning may necessitate amendments to the current Right-to-Farm Act. The language in the Act which voids local ordinances could be interpreted narrowly. For example, only ordinances which expressly and specifically state that agricultural facilities are nuisances may be held void. A broader reading of the Act, however, may result in undue restriction on the powers of local governments to attempt comprehensive land use planning. The primary enforcement tool for most zoning ordinances is the abatement of violations of the ordinance as nuisances. A broad interpretation of the Right-To-Farm Act could result in prohibiting local governments from effectively including agricultural uses in comprehensive planning.

V. GROWER-INTEGRATOR RELATIONS: IMPLICATIONS FOR ENVIRONMENTAL LIABILITY AND REGULATION

Most poultry and swine production facilities in Arkansas operate within a system of production contracts be-

166. Brenda Blagg, *Justices of the Peace Pursue "Farmer Friendly" County Zoning*, SPRINGDALE MORNING NEWS, May 26, 1993, at 1A, 2A.

167. *See, e.g.*, OHIO REV. CODE ANN. § 929.04 (Anderson 1988).

tween a vertical integrator, such as Tyson Foods, Inc. or Conagra, and an independent grower. Under production contracts between the grower and the integrator, the grower does not own the animals. The vertical integrator coordinates hatcheries or farrowing (hog breeding) operations and supplies the grower with the animals to be grown out for meat or egg production. Most aspects of the grow-out operation or egg production operation are strictly supervised and directed by the vertical integrator. Animal feed and drugs are supplied by the integrator, who reserves the right to inspect the production or breeding facilities. The integrator will then take the animals or eggs from the production farms to processing plants which the integrator operates.[168]

In a vertically integrated system, the integrator usually retains ownership of the animals. When these animals are raised by an independent grower under contract, the question arises as to who bears the legal responsibility for use or disposal of the animal waste. Arkansas has addressed this issue indirectly through legislation regarding disposal of dead poultry. Criminal liability for illegal disposal of dead fowl is imposed on "responsible persons," defined as persons who have direct responsibility for the day-to-day care of the fowl involved in the violation.[169] This allocation of liability may be equitable in a system in which the grower is truly independent and has control over housing conditions, feed, antibiotics, and other factors related to the health of the birds during the grow-out phase. However, many of these factors are not under the control of the grower.[170] Yet

168. For a general discussion of the relationship between grower and integrator in the animal production industry, *see* Clay Fulcher, *Vertical Integration in the Poultry Industry: The Contractual Relationship*, AGRIC. LAW UPDATE, Jan. 1992 at 4-6; Neil D. Hamilton & Greg Andrews, *State Regulation of Contract Feeding and Packer Integration in the Swine Industry*, AGRIC. LAW UPDATE, Jan. 1993 at 4-6; Keith D. Haroldson, *Two Issues in Corporate Agriculture: Anticorporate Farming Statutes and Production Contracts*, 41 DRAKE L. REV. 393, 409-18 (1992).

169. ARK. CODE ANN. §§ 2-40-401 to -402 (Michie 1987).

170. An example of a factor, of increasing concern to poultry scientists, is the breeding program of integrators which selects for rapid growth and protein production by the birds. Selection for these traits may inadvertently result in selection for health disorders and disease, which could ultimately lead to an increase in bird mortality during the grow-out phase. *See, e.g.*, Ted W. Odum, *Ascites Syndrome: Over-*

the grower, not the integrator, bears the burden of disposing of dead birds.

Liability may be assigned in the production contract. An examination of a number of hog and poultry production contracts between growers and vertical integrators indicates three major patterns of allocating legal responsibility for animal waste handling. In one approach, the contract clearly specifies that the animals are the property of the vertical integrator, not the grower; however, there is no mention of legal responsibility for the animal waste. A second approach is for the contract to expressly assign responsibility to the grower for general tort liability or for waste control and disposal.[171] The third approach is for the vertical integrator to suggest or require specific management

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view and Update, POULTRY DIGEST (Jan. 1993). Ascites syndrome is a specific type of congestive heart failure which appears to be increasing in the broiler chicken population. Ascites Syndrome may be caused by inequality between the metabolic demands of rapid body growth and cardiopulmonary performance. Many of the chickens afflicted with the disorder die during the grow-out phase.

171. *See, e.g.*, 1991 Cargill Feeder Pig Production Agreement with Arkansas grower which provides:

> Feeder agrees:
> To dispose of all manure and waste in accordance with recognized animal husbandry practices, and in compliance with all applicable health, sanitation, and environmental regulations.
> To indemnify and hold Cargill harmless from and against all losses, liability and expenses arising from damage to property or the injury to or death of any person, when such injury or damage arises out of or in connection with Feeder's performance of this Agreement; provided, however, that Feeder shall not be responsible for injury or damage caused by the sole negligence of Cargill.

1988 Poultry Growers, Inc. (Division of Tyson Foods, Inc.) Feeder Pig Producer Agreement with Arkansas grower:

> Producer agrees:
> To dispose of all manure, waste, and dead animals in accordance with recognized animal husbandry practices, and all applicable health, sanitation, and environmental regulations. Producer is the owner and operator of the farm described herein and that the responsibility for obtaining the appropriate federal, state, county and local permits shall be that of the producer. Producer agrees that Producer will not begin operations nor permit operations to begin prior to acquisition of the appropriate federal, state, county, and local permits, and that Producer will maintain said federal, state, county and local permits in full force and effect throughout the life of this agreement and will abide by the terms and provisions of said permits. The Producer agrees that Producer shall hold PGI harmless from any and all actions, claims, cost, attorney fees, judgments, penalties or rights of action which may arise at any time in relation to or in connection with the violation of any such permits.

practices for dealing with animal waste, with the agreement assigning legal responsibility for waste control and disposal to the grower.[172]

Vertical integrators in Arkansas do not want to assume any direct legal responsibility for the animal waste disposal problems of their contract growers.[173] These companies, however, have provided some funding and technical assistance to producers. For example, Tyson Foods, Inc. and Cargill funded a program in Pope County to employ a water quality technician to work with farmers in developing animal waste management plans. Some companies are also providing their growers with information on the best management practices for handling animal waste. Recently, Tyson Foods distributed freezers to two thousand of its growers. The freezers will hold dead birds for delivery by Tyson to a rendering plant, but the growers must pay for the electricity to operate them.[174]

One perspective in resolving the issue of whether growers or integrators bear liability is that taken by economists who advocate the view that products should reflect the true costs of their production, including the costs of environmental protection. From this perspective, consumers who ultimately enjoy the benefits of the products should bear the costs of production.[175] Most contract growers are price takers; they have little or no bargaining power in their relations with the integrators. They cannot adjust the contract to include costs of environmental protection, and their only recourse is to choose not to enter into a contract. Growers cannot pass along the costs of environmental protection to the consumers. Integrators, however, are in a position to pass this cost through to consumers.

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172. *See, e.g.*, 1990 Conagra Broiler Co. Pullet Growing Contract with Louisiana grower which provides that the Producer agrees "to use an approved pit or incinerator for disposal of dead birds."

Conagra Pullet Management Program also provides an Information Packet to potential Producers which specifies sanitation and litter and clean-out methods.

173. *Playing Chicken: Poultry Companies, Growers and Government Agencies Square Off as Animal Wastes Pile Up*, ARK. BUS., May 11, 1992 at 16.

174. David F. Kern, *Poultry Firms Shirking Costs, Ex-Grower Says*, ARK. DEMOCRAT GAZETTE, Mar. 15, 1993, at 1D.

175. *See, e.g.*, Ruff, The Economic Common Sense of Pollution, in Pollution, Resources, and the Environment 37 (A. Enthoven and A. Freeman eds. 1973).

Another perspective is that of efficiency and practicality in implementing and enforcing environmental protection measures. Integrators, unlike individual contract growers, have access to transportation networks, processing and rendering facilities, and other large-scale, offsite means of dealing with animal waste. One possible approach is for integrators to bear the burden of dealing with animal waste to the extent that the waste exceeds the ability of the land and crop base available to individual growers to absorb the waste within their operations. This approach will be increasingly more practical as growers develop nutrient management plans for their operations. Regulation No. 5 may already provide this solution if growers who do not have access to adequate land application sites must scale down their operations or be denied an operating permit. An agreement that the integrator will bear responsibility for offsite waste disposal might allow growers to increase production capacity and, at the same time, allow the increased cost to be passed to the consumer.

CONCLUSION

As livestock and poultry production continues to expand in Arkansas, along with population growth in rural areas, the state's policy regarding management of animal waste will need appropriate revision. Two areas will likely require attention in the near future. First, the total exemption of agriculture from the air pollution code will have to be reevaluated. The primary complaint from property owners near confinement animal facilities results from the odor. Due to this exemption, the Department of Pollution Control and Ecology lacks authority to deal with agricultural source air pollutants. Second, as local governments attempt to develop their own measures for dealing with facility locations through comprehensive planning and zoning, the restrictions on ordinances, such as those found in the Arkansas Right-to-Farm Act, will necessarily have to be limited in order for such measures to deal with the location of agricultural facilities in a meaningful way.

In addition, if the re-authorization of the federal Clean Water Act incorporates mandatory regulation of animal ag-

ricultural nonpoint source pollution, as now appears to be developing in the Coastal Zone Act Reauthorization Amendments, the state will have to move beyond the current voluntary BMP program and develop enforceable management measures. The model provided by Regulation No. 5 for Liquid Animal Waste Management may serve as the basis for similar programs for other nonpoint sources, such as land-applied dry poultry litter.

Finally, even in the absence of mandatory control requirements in the revision of the Clean Water Act, if the EPA takes the position that Arkansas must develop a concentrated animal feeding operation control program with the same degree of stringency and in a manner consistent with federal regulations now applicable in other Region VI states, even dry litter operations may be brought within the general permit point source requirements. This will necessarily involve restrictions on activities potentially contributing to pollution.

The steps Arkansas has taken in recent years to address animal waste management have considerable merit as initial steps toward a more comprehensive program. In fact, an argument can be made that the voluntary approach in dealing with dry poultry litter will succeed in reducing potential pollution if the integrators and producers continue to cooperate in developing animal waste management plans. The voluntary option may well be foreclosed in the future. Thus, the industry and the regulatory agencies must look forward in developing feasible programs acceptable to the federal agency.

In a recent article in *The Atlantic*, Matt Ridley and Bobbi S. Low suggest that environmental policy must tap that most basic of human interests — self interest.

> Biologists and economists agree that cooperation cannot be taken for granted. People and animals will cooperate only if they as individuals are given reasons to do so. For economists that means economic incentives; for biologists it means the pursuit of short-term goals that were once the means to reproduction. Both think that people are generally not willing to pay for the long-term good of society or the planet. To save the environment, therefore, we will have to find a way to reward individu-

> als for good behavior and punish them for bad. Exhorting them to self sacrifice for the sake of "humanity" or "the earth" will not be enough.[176]

The authors admit that this view goes against conventional wisdom, but they emphasize that the successes in environmental policy have occurred in situations where individual incentives are changed and by seeking the "most enforceable, least bureaucratic, cheapest, most effective incentives."[177] This should be the goal of industry and of state officials in seeking a framework for management of animal waste in Arkansas. The framework must recognize the differing roles of integrators and growers in the production process and encourage means by which costs may be fairly shared among those affected, including consumers.

TABLE 1
ANIMAL MANURE PRODUCED IN ARKANSAS
(1989)[178]

Animal Class	# Animals Produced	Tons of Manure Produced
Broilers	920,000,000	1,010,000
Hens	23,000,000	276,000
Turkeys	19,800,000	141,000
Cattle	1,750,000	2,625,000
Dairy	68,000	160,000
Swine	540,000	108,000

Total Production of Animal Manure in 1989 = 4,320,000 tons

176. Matt Ridley & Bobbi S. Low, *Can Selfishness Save the Environment?*, THE ATLANTIC, Sept. 1993 at 76.

177. *Id.* at 80.

178. Source: ARKANSAS SOIL & WATER CONSERVATION COMM'N, NONPOINT SOURCE MANAGEMENT STATUS REPORT NO. 2, at 4 (June-July 1991).