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## AGRICULTURE: OPERATING IN AN ERA OF REGULATION

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The regulatory environment faced by agriculture is rapidly changing, growing in both scope and severity. Once largely exempt from the full force of regulatory oversight especially under the Clean Air Act and Clean Water Act, production agriculture is increasingly implicated by environmental groups and government agencies as an industry in need of tighter environmental control. Recent efforts to update and tighten regulation of confined animal feeding operations (CAFOs), continuing controversy over the Clean Water Act's Total Maximum Daily Load (TMDL) provisions, and concern over air emissions by livestock facilities and farm equipment are just a few examples that portend a new era in which agriculture is at the center of environmental debates and initiatives. These new pressures could have powerful implications for costs of production, industry competitiveness, and the structure of the US agriculture sector.

### **Where are we now, and how did we get here?**

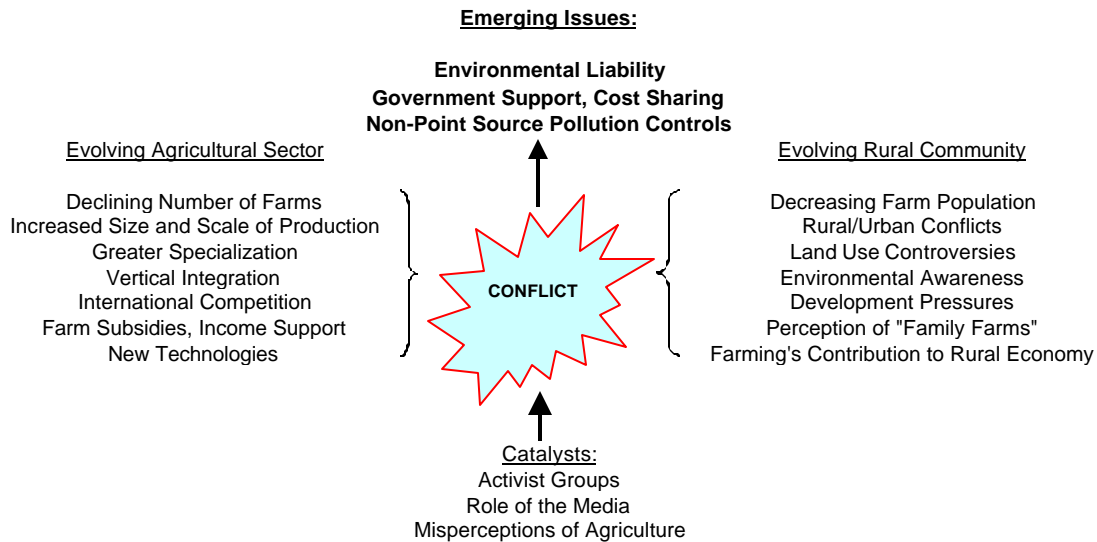
To an important degree agriculture has traditionally been a relatively "safe haven" from the full force of regulatory oversight concerning air and water pollution. This reflected several factors including:

- An initial regulatory focus on the most publicly visible, egregious contributors to pollution concerns, such as major industrial facilities, coal burning power generators, and automobile emissions.
- Widespread favorable political support and public sentiment that farmers are "stewards of the land", and cultural icons undeserving of government repress and intervention.
- A farm sector consisting of relatively small geographically dispersed operations each of which has a low pollution potential, making direct regulatory oversight administratively burdensome relative to the potential environmental benefits.
- Technical inability to accurately monitor or control non-point source air and water emissions (i.e., "runoff"), which is the primary type of pollution often linked to agriculture

However, today's agriculture sector finds itself increasingly at the forefront of aggressive new environmental measures at the federal, state and local levels. Consider the following:

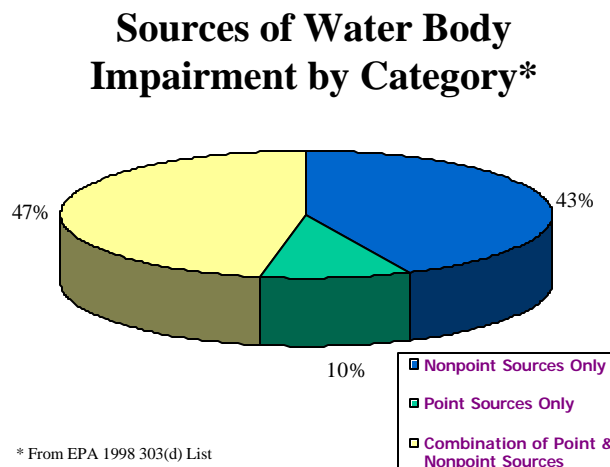
- Regulatory controls of point source emissions are widely viewed as successful and nearly complete, but air and water quality concerns remain.
- Public and political support for "special treatment" of agriculture in environmental regulations is eroding quickly, as urban pressures encroach on farmland and residents object to odors associated with livestock production, and new and more stringent air and water quality standards have been found by the courts in California and elsewhere to legally apply to agricultural operations.
- Structural change in the farm sector and the increased importance of large-scale operations that are often concentrated within a tight geography. The largest operations are increasingly opposed by local communities and are often the target of environmental protest.
- An increased emphasis within EPA on non-point source pollution, such as runoff from agricultural operations, driven by persistent water quality concerns and tighter standards.

Environmental and regulatory pressures facing agriculture today are unlikely to abate over the long term, despite occasional political efforts to “roll back” regulatory oversight. In fact, the forces leading to increased regulation over time reflect structural changes occurring in the agricultural sector at the same time that the non-farm population grows and becomes less attuned to the unique characteristics of farming. The interaction of these opposing forces is illustrated below:



Added to the structural and community factors that portend greater agricultural regulation, is the widely held belief within EPA and among various environmental interest groups that existing efforts to regulate air and water emissions from industrial and municipal facilities, in place for more than 30 years, have largely achieved their goal. Most of these efforts have focused on “point-source” emissions; minimizing harmful emissions from individual facilities that discharge directly into the air or a waterbody, such as smokestack industries or wastewater treatment plants. These facilities mostly have already incurred significant costs to reduce their output of various pollutants, and even tighter standards are unlikely to greatly improve overall environmental quality beyond current levels.

But water and air quality concerns remain despite these efforts, so the focus is increasingly shifting towards minimizing “non-point” source emissions; pollutants that enter the air or a waterbody as a result of general runoff from land, roads and forests. EPA estimates that only 10% of impaired waters are the direct result of point source emissions (see chart), with the vast majority attributed to either non-point sources exclusively, or some combination of point and non-point source emissions. Runoff from agricultural fields and livestock facilities, including fertilizer, manure and pesticides, is often implicated as one of the primary contributors of non-point source pollution.



Regulating non-point source emissions is challenged by the current, relatively primitive, state of monitoring and measurement technology, especially since it is extremely difficult to identify a specific source of agricultural runoff that might travel long distances and across legal boundaries. As a result, regulators tend to take a “broad

brush” approach to regulating the agriculture sector, by mandating or encouraging specific land uses and/or best-management practices aimed at reducing runoff by all farms in a given area or watershed. This is at the center of EPA’s Total Maximum Daily Load (TMDL) program, which requires states to identify all impaired waterbodies within their boundaries, and identify measures to reduce the total amount of pollutants entering the body of water from any source—including agriculture. While the most recently proposed rules for implementing the TMDL program (developed by EPA in 2000) have never been enacted and are currently under review to be repealed, the pressures that prompted the development of that rule remain intact, and are likely to lead to continued scrutiny of agriculture as a source of water pollution concerns.

### **New Environmental Regulations for Livestock Producers**

EPA recently (December 15) released its long awaited new rule governing the permitting process for Confined Animal Feeding Operations (CAFOs). The rule will apply primarily to “large” CAFOs, defined as those meeting the following size criteria of housing at least:

#### **EPA Size Criteria for Large CAFOs:**

- |                                       |   |
|---------------------------------------|---|
| • 700 mature dairy cows               | • 30,000 ducks (non-liquid manure system)                         |
| • 1,000 beef cattle or heifers        | • 5,000 ducks (liquid manure system)                              |
| • 1,000 veal calves                   | • 30,000 chickens (liquid manure system)                          |
| • 500 horses                          | • 125,000 chickens (except laying hens; non-liquid manure system) |
| • 2,500 swine (each 55 lbs or more)   | • 82,000 laying hens (non-liquid manure system)                   |
| • 10,000 swine (each under 55 pounds) | • 55,000 turkeys  |
| • 10,000 sheep or lamb                |   |

The rule will also apply to some smaller operations (defined as “medium” CAFOs) if a manmade ditch or pipe carries manure or wastewater from the operation to surface water, or if the confined animals come into contact with surface water running through the confinement area. Operations that meet these criteria will be subject to the new CAFO regulations if they also house at least:

#### **EPA Size Criteria for Medium CAFOs:**

- |                                      |  |
|--------------------------------------|--|
| • 200 mature dairy cows              | • 10,000 ducks (non-liquid manure system)                        |
| • 300 beef cattle or heifers         | • 1,500 ducks (liquid manure system)                             |
| • 300 veal calves                    | • 9,000 chickens (liquid manure system)                          |
| • 150 horses                         | • 37,500 chickens (except laying hens; non-liquid manure system) |
| • 750 swine (each 55 lbs or more)    | • 25,000 laying hens (non-liquid manure system)                  |
| • 3,000 swine (each under 55 pounds) | • 55,000 turkeys   |
| • 3,000 sheep or lamb                |  |

In addition, regardless of the size of the operation, the permitting authority could designate a livestock operation as a CAFO if an inspection finds that it threatens nearby surface waters.

The primary changes implemented by new CAFO regulations include:

- All CAFOs must apply for a National Pollutant Discharge Elimination System (NPDES) permit
- All large chicken operations must apply for a permit, even if using a dry manure system
- Large swine nurseries and heifer operations must apply for a permit
- CAFOs must implement nutrient management plans based on nitrogen and phosphorous content, to ensure the manure application does not exceed assimilative capacity of the crops produced. Appropriate best management practices must focus on protecting water quality

- CAFOs must submit annual reports summarizing key information about their operation
- Facilities must provide storage that will contain their manure plus the wastewater from a major storm (No more “25-year storm” discharge exemption)

EPA predicts that the new regulations will affect about 15,000 existing livestock operations, with compliance costs across the livestock sector of about \$326 million annually (Table 1).

**Table 1. EPA Estimates of Compliance Cost for New CAFO Rule**

Sector	Number of CAFO Operations by Type			Total Compliance Costs			
	Total	Large	Medium	Total	Large	Medium	Designated
	<i>Number</i>			<i>\$ Million, 2001 pre-tax</i>			
Fed Cattle	1,940	1,766	174	88.2	85.8	1.9	0.5
Veal	19	12	7	0.2	0.1	0.1	0.0
Heifer	472	242	230	6.3	3.8	2.4	0.1
Dairy	3,399	1,450	1,949	151.1	128.2	22.0	0.9
Hogs	5,409	3,924	1,485	34.8	24.9	9.5	0.4
Broiler	2,152	1,632	520	20.5	16.8	2.4	1.3
Layers: Dry	755	729	26	7.5	7.2	0.1	0.2
Layers: Wet	407	383	24	8.9	8.4	0.5	0.1
Turkeys	425	388	37	8.7	8.1	0.3	0.3
Total	14,978	10,526	4,452	326.0	283.3	39.2	3.8

Compliance costs will vary across livestock sectors and types of operations, ranging from \$88,414 per year for large dairy operations to \$3,846 for medium size layer operations that use a dry manure system (Table 2). EPA suggests that for most operations (80%) these costs will present little if any financial burden, but that 3% of large CAFOs and 6% of medium CAFOs will as a result of these rules experience “financial stress,” putting them in jeopardy of going out of business (Table 3). The burden is expected to be especially acute among medium-size fed cattle operations, with EPA predicting that 96% of fed cattle operations with between 300-1000 head that are designated as CAFOs would likely become unprofitable as a result of this new rule. About 18% of medium-sized heifer operations designated as CAFOs will find themselves in a similar predicament. Moderate financial stress is predicted for 14% and 7% of large and medium CAFOs respectively, with most of the burden focused on dairy, hog and broiler operations.

**Table 2. Annual Pre-Tax Cost of New CAFO Rule per Operation, by Type and Size**

Sector	Average Cost Per CAFO		
	Total	Large	Medium
	<i>Annual Compliance Cost per Operation</i>		
Fed Cattle	\$45,464	\$48,584	\$10,920
Veal	\$10,526	\$8,333	\$14,286
Heifer	\$13,347	\$15,702	\$10,435
Dairy	\$44,454	\$88,414	\$11,288
Hogs	\$6,434	\$6,346	\$6,397
Broiler	\$9,526	\$10,294	\$4,615
Layers: Dry	\$9,934	\$9,877	\$3,846
Layers: Wet	\$21,867	\$21,932	\$20,833
Turkeys	\$20,471	\$20,876	\$8,108
Total	\$21,765	\$26,914	\$8,805

**Table 3. EPA Estimates of Financial Effects of New CAFO Rule, by CAFO Size and Type**

Sector	Large		Medium	
	Moderate	Stress	Moderate	Stress
	<i>Percent of Operations (%)</i>			
Fed Cattle	0	3	0	96
Veal	0	0	0	0
Heifer	0	9	0	18
Dairy	30	0	2	0
Hogs	12	5	0	0
Broiler	36	1	48	1
Layers: Dry	0	0	0	0
Layers: Wet	0	0	0	0
Turkeys	0	0	0	0
Total	14	3	7	6

Despite the apparently high cost of compliance, these new CAFO rules are in fact somewhat *less stringent* than what was originally proposed, and will apply to fewer operations than originally proposed. Also, these federal regulations only set the minimum standard for CAFO regulation, expressly providing states substantial flexibility and oversight to develop and enforce their own standards that might exceed those set by the new CAFO rule. So, it is safe to assume that these cost estimates represent a minimum to the sector and to individual operations, with actual costs potentially much higher (and applying to a greater number of operations) as individual states develop and enforce their own guidelines.

### **Other Regulatory Pressures Building**

While the new CAFO regulations are the most recent and concrete evidence of new environmental pressures and regulatory oversight facing the agriculture sector, other sources of regulatory pressure are building on several fronts. These include:

- **Clean Air Issues.** Efforts to regulate air pollution have traditionally focused on heavy industry, not agriculture. But continued tightening of national ambient air quality guidelines, including the new and greater emphasis on fine particulate matter, is creating a new focus on agriculture's contribution to air quality concerns. Persistent air pollution concerns in California have recently led the courts to determine that agriculture is not exempt from air quality standards, bringing the sector solidly into regulatory oversight. And, the implications extend far beyond California, with odor and other air emissions from livestock operations becoming of greater public concern nationwide and many states already requiring a variety of Best Management Practices to minimize emissions. USDA and EPA are exploring the issue, focusing on the extent of the problem and methods of control. Air emissions regulation of livestock facilities will surface in the not-so-distant future, possibly requiring measures even costlier and more comprehensive than the current water quality based CAFO rule.
- **Regulation of Agricultural Inputs.** Use of pesticides in crop production and antibiotics in animal feed have greatly contributed to the rapid productivity growth experienced by the agriculture sector in recent decades. But concerns about possible adverse effects on human health have long threatened the use of some of these inputs. These concerns have only grown over time, and are likely to continue to narrow the range of chemical technologies available for widespread use. Pressures to dramatically reduce antibiotic use in livestock production are coming from several sources, both regulatory and consumer driven. It is extremely likely that their use will be dramatically curtailed in the not too distant future.

- **Pressures from Special Interests.** Various special interest groups, once considered “fringe” organizations and easily ignored, are becoming increasingly influential in determining how food is produced. Issues ranging from the use of genetically modified plants in food production, to various environmental concerns, to animal welfare are becoming almost mainstream as advocate groups make sophisticated use of various media outlets, public protests, and organized boycotts. Major US food companies are beginning to respond directly through appeasement, instituting supplier guidelines and regulating production techniques in ways that go far beyond legal requirements. This new era of industry “self imposed” regulation will have enormous consequences in coming years.

The regulatory pressures facing the agriculture sector are real and increasing, and are building at a time when knowledge of production agriculture among the general public—and often among lawmakers and regulators as well—is generally on the decline. As the farm population continues to decline (with an even more rapid decline in the number of commercial farms whose income derives totally from agriculture) regulatory control becomes much more subject to the whims of popular opinion and emotion rather than the true benefits and costs to society. Although there are important instances where environmental and food safety regulations should be updated or more broadly enforced to reflect structural change in the sector, it is also important that credible scientific information be used to identify the actual problem areas and determine the true benefits and costs of regulatory controls. It is important that the USDA, land grant universities, and industry organizations remain involved and informed in the regulatory process to ensure that the interests of agriculture are fully represented.



# **Agriculture: Operating in a New Era of Regulation**

**USDA Outlook Conference  
February 21, 2003**



# **A New Era of Regulation**

## **Why This Study?**

- Most current laws in place three decades or more
  - Significant pressure update
- New pressures building
  - Growing population/urbanization pressure
  - Increasing concentration/industrialization of agriculture
  - Growing media consciousness
  - Changing public perception of agriculture
- Forces unlikely to abate
  - Not a function of political parties

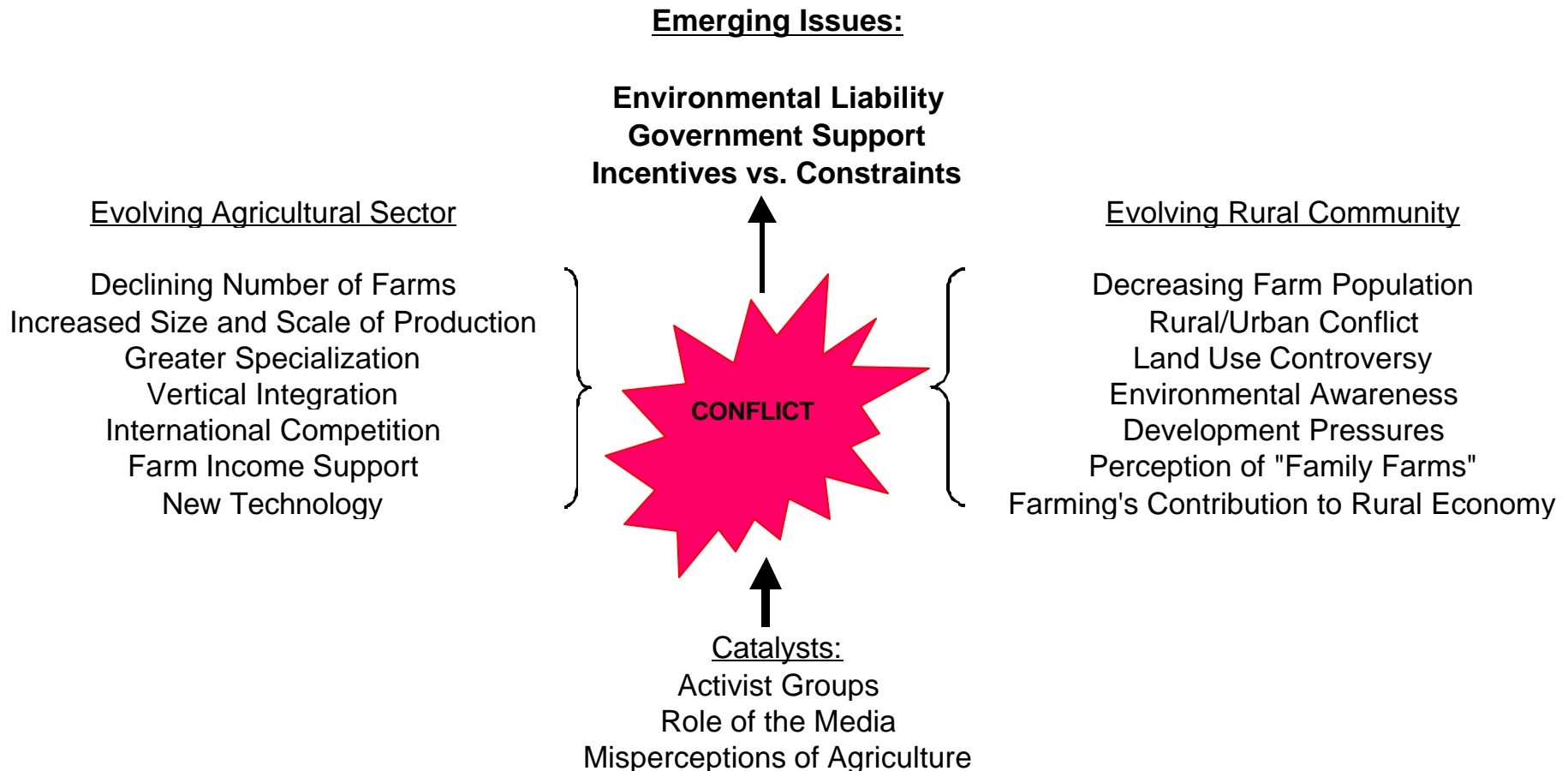
# Regulatory Pressures

- Clean Water
  - Point vs. Non-point, Hypoxia, TMDLs, CAFOs...
- Clean Air
  - Particulates, AFO emissions, spray drift...
- Regulation of Input Use
  - Pesticides, Antibiotics...
- Consumer Pressures
  - Animal Welfare
  - “Factory Farms”
  - Environment, Pesticide Use, Organics, etc

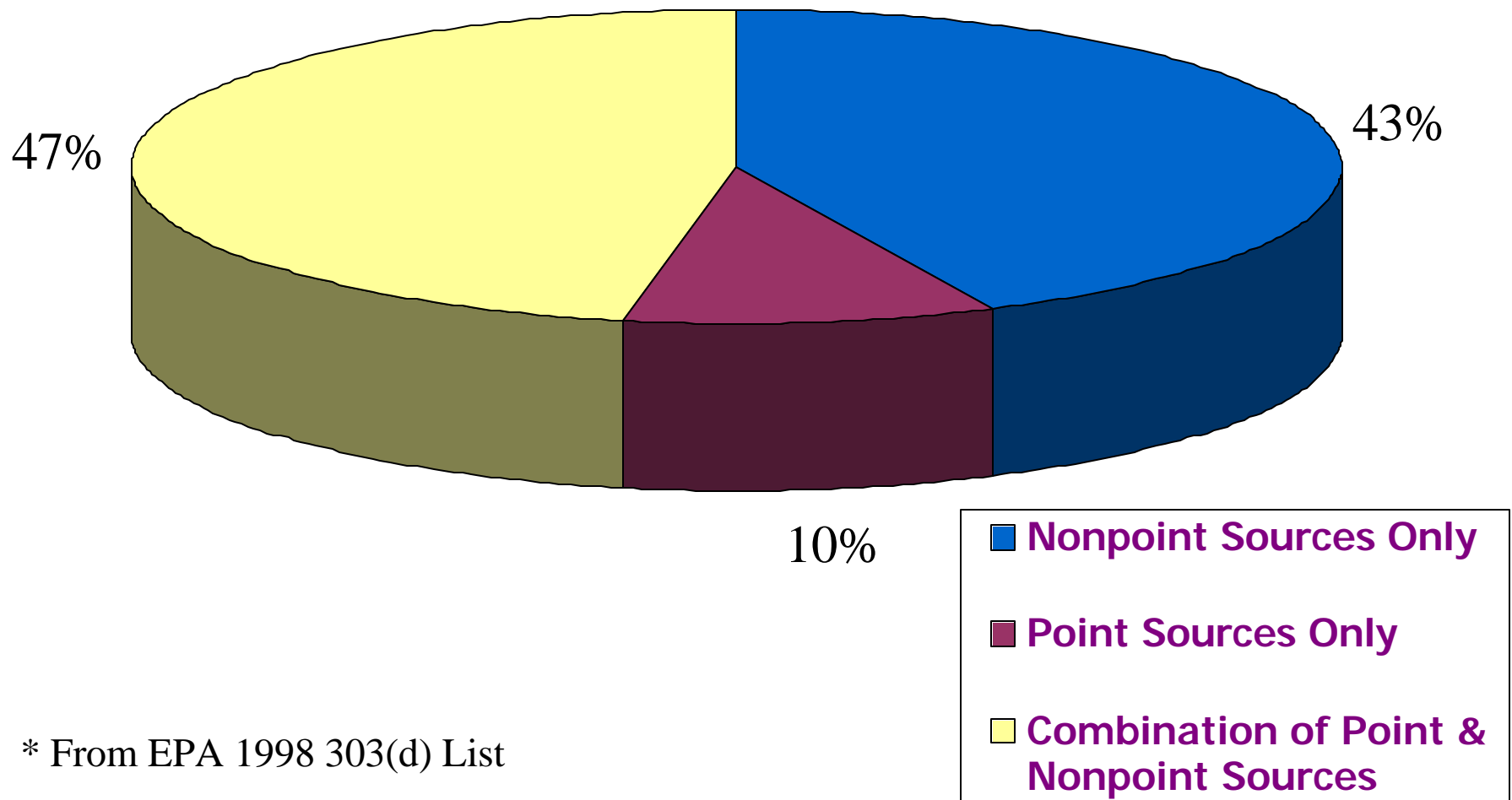
# Wide Range of Other Pressures

- Social pressures: Corporate farming, local ordinances, country of origin...
- Labor regulations
- Transportation regulations
- Market pressures, activist groups
  - Animal welfare
  - GMOs
  - Family farms

# New Pressures on Agriculture

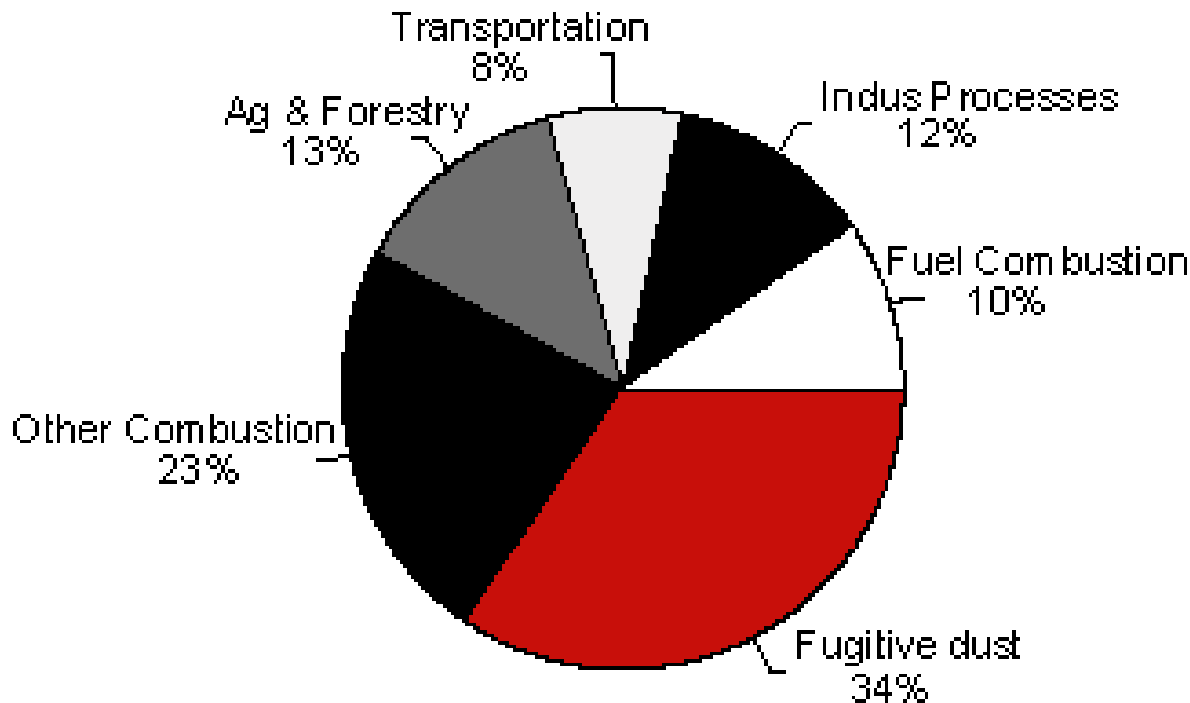


# Water Concerns: Sources of Impairment by Category\*



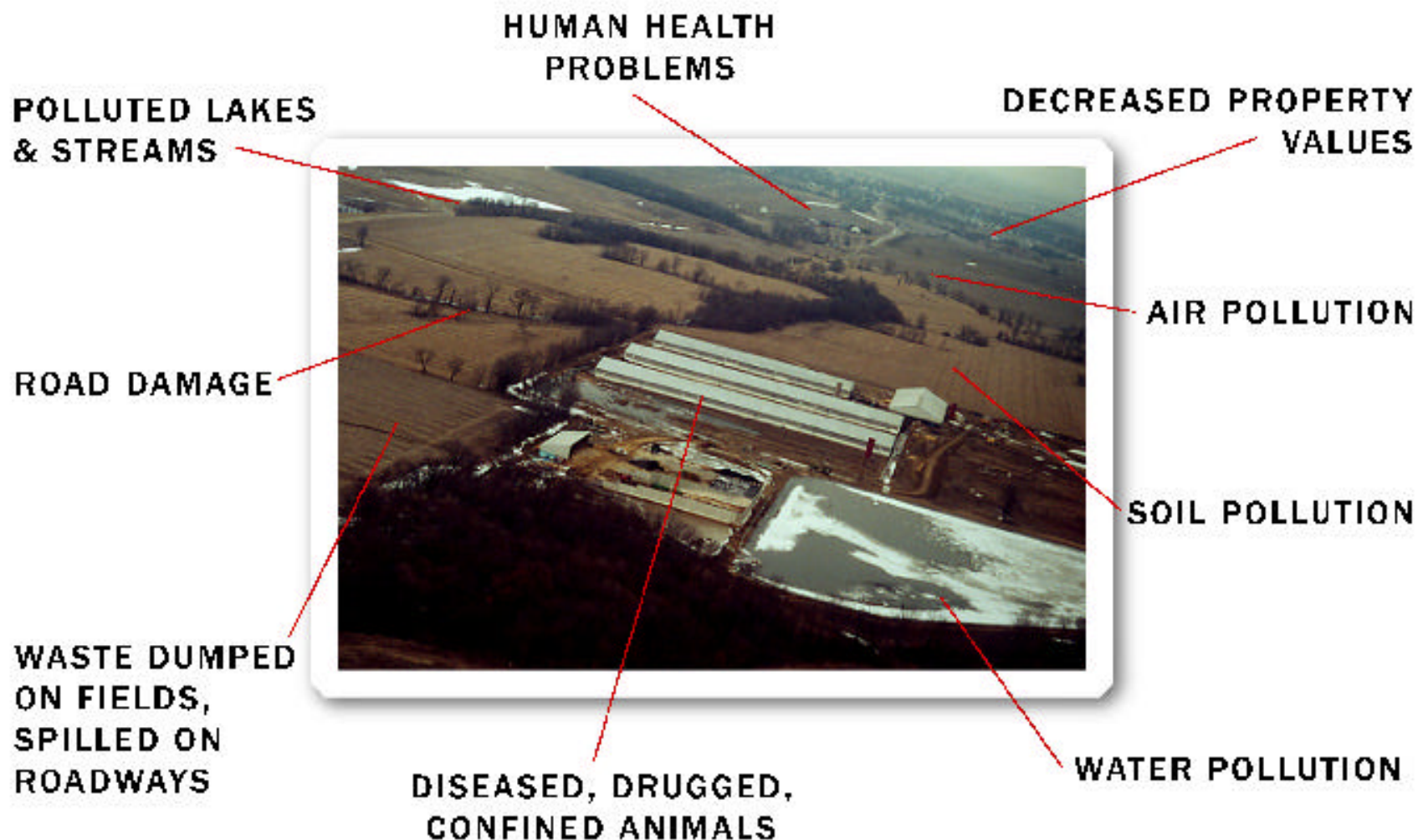
\* From EPA 1998 303(d) List

# Air Concerns: EPA Estimated PM<sub>2.5</sub> Emissions By Source



# **WHAT TO EXPECT WHEN A FACTORY FARM COMES TO TOWN**

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# Critical Issues

- State and local regulatory oversight
  - Most “efficient” form of regulation, but important implications for firm location patterns, geographic structure, regional competitiveness
- Distribution of costs
  - Large fixed costs favor large operations, medium sized operations get squeezed
- State of technology drives ability to monitor, enforce, and regulate
  - “margins of safety” set dangerous precedents, e.g. TMDLs

# Agricultural Regulation

Some impacts:

- More need for record keeping, custom application services, crop consulting, rule compliance
- Encourages use of technology: biotech, precision ag
- Important implications by size, type of operation
- Potential for “emissions trading?”
- Greater accountability along the food production chain
- Role for government in sharing compliance costs?

# Conclusions, Implications

- Regulatory pressures are real and increasing, with implications for costs, competitiveness, investment and markets
- Intensity can change with political shifts and government priorities, but underlying forces for greater regulation will remain strong.
- Local community pressures and activist groups often have the greatest impact
- A key question for regulators is how to achieve desired outcome: through “command and control” or by providing market incentives?

# Challenges

- Sector must prepare for greater costs, reduced options, more paperwork
- Finding opportunities among the new constraints
- Maintaining favorable public perception, avoiding a strictly “defensive” posture.